IBM

Mag Card

Adjustment Parts Manual

S241-5584-8

- IBM Mag Card II
- IBM Mag Card/A
- IBM Memory Typewriter
- IBM Mag Card Composer
- IBM Mag Card "Selectric" Typewriter
- IBM Mag Card "Executive" Typewriter
- IBM Electronic "Selectric" Composer

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SAFETY PRECAUTIONS

All IBM Customer Engineers are expected to take every safety precaution possible and observe the following safety practices when servicing IBM equipment.

Mechanical Safety:

1. *Safety glasses must be worn.*
2. *All safety devices, such as guards, shields, signs, ground wires, etc., must be restored after maintenance. When a guard or shield is removed to observe or make an adjustment, that shield must be replaced when work in the area is completed.*
3. *Watches, rings, necklaces, ID bracelets, etc., must be removed when servicing the machine.*
4. *Care must be used when working near moving parts. Keep hair away from moving parts. Avoid wearing loose clothing that might be caught in the machine. Shirt sleeves must be kept buttoned or rolled above the elbows. Ties must be tucked in the shirt or have a tie clasp approximately three inches from the end. Tie chains are not recommended.*

Electrical Safety:

1. *The equipment referenced in this manual may use high voltages. Check voltage labels!*
2. *Safety glasses must be worn when checking energized circuits.*
3. *If a circuit is disconnected for servicing or parts replacement, it must be reconnected and tested before allowing the use of the machine.*
4. *Power should be removed from the machine for servicing whenever possible. Remember, when checking voltages, avoid contacting ground potential, such as metal floor strips, machine frame, etc.*
5. *Meter continuity checks should be used instead of voltage checks whenever possible.*

General Safety:

1. *Each Customer Engineer is responsible to be certain no action on his/her part makes the product unsafe or exposes customer personnel to hazards.*
2. *Store the removed machine covers in a safe, out of the way place where no one can trip over them.*
3. *If you must leave the machine in a down condition, always install the covers and disconnect the power before leaving the customer's office.*
4. *Always place CE tool kit away from walk areas where no one can trip over it.*
5. *Maintain safe conditions in the area of the machine while performing and after completing maintenance.*
6. *Before starting the equipment, make sure fellow CEs and customer personnel are not in a hazardous position.*
7. *All the machine covers must be in place before the machine is returned to the customer.*

Note: *Refer to the Safety CEMs relating to this product(s) for further safety precautions.*

INTRODUCTION

This manual is written for both U.S. and World Trade usage. It contains sections for adjustments, diagnostics and parts manual.

Product Name	Product Code
IBM Mag Card "Selectric" Typewriter	24
IBM Mag Card "Executive" Typewriter	24
IBM Mag Card "Selectric" Typewriter – Communicating Feature	24
IBM Mag Card II	24
IBM Mag Card II – Communicating	24
IBM Mag Card/A	24
IBM 6240 – Communicating	24
IBM Memory Typewriter	28
IBM Electronic "Selectric" Composer	30
IBM Mag Card Composer	30

ADJUSTMENT SECTION

Purpose
This section provides experienced service personnel a reference for the most commonly used adjustments. Refer to other Product Service publications if additional information is needed.

Adjustment Identification
The headline of each page shows the product name, product code and the name of the mechanism covered on that page. Each adjustment is indicated by a black frame number on the top left corner, followed by the adjustment name and mechanism code/reference number. If one frame covers adjustments for more than one product or product level, they are indicated by the product name and/or the level number. The machine mode, the view of the drawing and safety precautions are also noted when required.

Adjustment Sequence
The frame numbers indicate the sequence of adjustments. One adjustment could affect a following adjustment. Therefore, check all the following adjustments in that mechanism. Red numbers on the bottom left corner of the frame indicate adjustments out of sequence that could be affected and should be checked.

Adjustment Procedure
The part to be adjusted is colored red and a red arrow shows the direction of movement. Tolerances and/or additional information on how to perform the adjustment are shown when required.

Always use the adjustment tolerance shown in the publication with the latest date.

Call Reporting (US Only)
Use the mechanism codes/reference numbers shown after the frame number and frame name for call reporting. The reference number is not always the number of the part that is colored red.

DIAGNOSTICS SECTION

Functional Checks – Provide a reliable procedure to test the different mechanisms for failure.

Flow Charts – Provide a block logic procedure of finding problem areas.

Operating Instructions – Provide procedures to exercise the machine the way the operator is instructed.

Print Quality Diagnostics Example – Covers symptoms and causes of print problems.

Wiring Diagrams – Provide point to point wiring and resistance readings for trouble-shooting.

Code Charts – List the character and function codes sent from the transmit block to the printer.

Refer to other Product Service publications when additional diagnostics are needed.

PARTS MANUAL SECTION

Introduction
This section contains parts drawings of mechanisms, reference numbers and other special information. It must be used with a separate part number/price list which contains reference numbers, part numbers, part descriptions and prices.

Mechanism Identification
The headline of each page shows the product name, and product code covered on that page. The headline of each frame shows the mechanism name and the mechanism code covered in that frame. Some frames will show a model identification code after the mechanism name. Some mechanisms require more than one frame. However, each mechanism consists of a group of parts that work together to perform a function.

Part Identification
Red numbers indicate the reference number of a part, a bill of material (B/M) or an assembly.

Red blocks within a frame indicate either one, or a combination of more than one, of the following:

- Differences between features.
- Different levels within the same model (level 1, level 2, etc.).
- Field replacement parts.
- Bill of material (B/M) or assemblies (shown with a description – parts shown in the drawing).
- World Trade application or differences.

If different levels exist, which can be used for all models, only the newest level is shown in the drawing. However, the part number/price list will show all level parts.

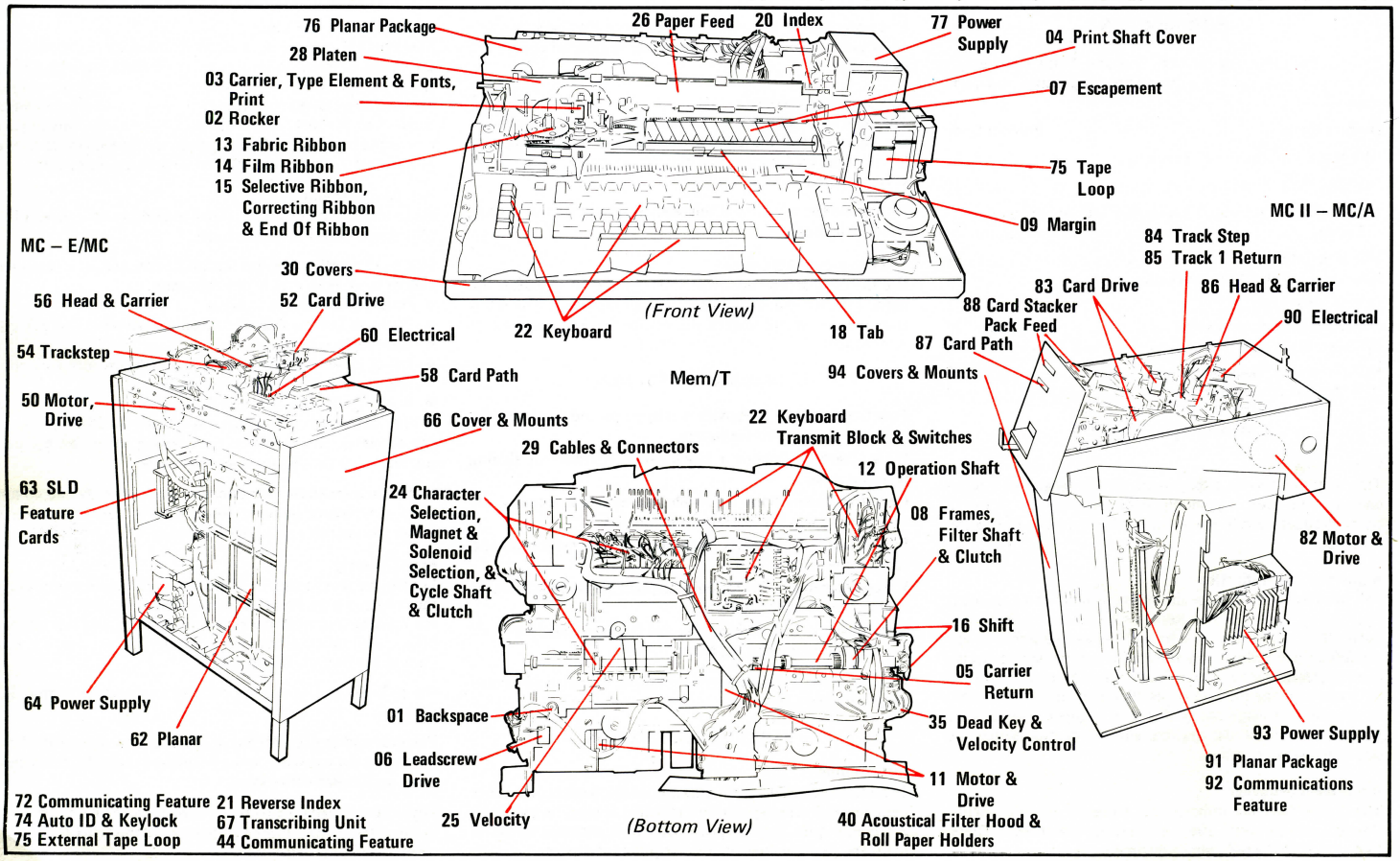
Some parts are shown for assembly purposes only and do not show a reference number. Replace these parts by ordering either the assembly or a later level part.

Parts Ordering
Locate the mechanism in which the part functions by using the contents page. Note the mechanism code, find the part in the drawing and note the reference number. Use this mechanism code/reference number to locate the part number and price in the part number/price list.

World Trade should use the country's procedures to find the prices.

Features and devices (MESs) or specification changes (SERs), wished by the customer, must be ordered through CE management and branch office sales.

Replacement parts for features, devices and SERs, not shown in the parts manual, must also be ordered through CE management and branch office sales.


76 Planar Package
28 Platen
03 Carrier, Type Element & Fonts, Print
02 Rocker
13 Fabric Ribbon
14 Film Ribbon
15 Selective Ribbon, Correcting Ribbon & End Of Ribbon
26 Paper Feed
20 Index
77 Power Supply
04 Print Shaft Cover
07 Escapement
75 Tape Loop
09 Margin
MC II – MC/A
84 Track Step
85 Track 1 Return
83 Card Drive
86 Head & Carrier
88 Card Stacker Pack Feed
90 Electrical
87 Card Path
94 Covers & Mounts
82 Motor & Drive
93 Power Supply
91 Planar Package
92 Communications Feature
MC – E/MC
30 Covers
56 Head & Carrier
52 Card Drive
60 Electrical
54 Trackstep
58 Card Path
50 Motor, Drive
66 Cover & Mounts
63 SLD Feature Cards
64 Power Supply
62 Planar
72 Communicating Feature
74 Auto ID & Keylock
75 External Tape Loop
21 Reverse Index
67 Transcribing Unit
44 Communicating Feature
(Front View)
22 Keyboard
18 Tab
Mem/T
22 Keyboard Transmit Block & Switches
29 Cables & Connectors
12 Operation Shaft
24 Character Selection, Magnet & Solenoid Selection, & Cycle Shaft & Clutch
08 Frames, Filter Shaft & Clutch
16 Shift
05 Carrier Return
01 Backspace
35 Dead Key & Velocity Control
06 Leadscrew Drive
11 Motor & Drive
25 Velocity
(Bottom View)
40 Acoustical Filter Hood & Roll Paper Holders

PARTS			ADJUSTMENTS	
Mech Code	Page	Mechanism	Frame	Page
INTRODUCTION				I
		I/O TYPEWRITER		
40 ..	253 .	Acoustical Filter Hood	422 .	62
		Alignment	99 .	28
01 ..	219 .	Backspace	200 .	38
		Leadscrew	193 .	38
29 ..	248 .	Cable And Connectors		
03 ..	220 .	Carrier		
05 ..	222 .	Carrier Return – MC	247 .	43
05 ..	223 .	Leadscrew	258 .	44
24 ..	239 .	Character Selection	53 .	23
44 ..	255 .	Communicating Feature		
30 ..	250 .	Covers	404 .	59
24 ..	240 .	Cycle Shaft & Clutch	53 .	23
35 ..	253 .	Dead Key	161 .	34
07 ..	224 .	Escapement – MC	151 .	33
		Leadscrew	164 .	34
18 ..	233 .	Fluid Clutch	223 .	41
08 ..	225 .	Frames, Filter Shaft & Clutch	6 .	18
20 ..	235 .	Index	297 .	48
22 ..	237 .	Keyboard Selection	6 .	18
22 ..	238 .	Keyboard Switches		
76 ..	267 .	Key Lock Feature	18 .	66
06 ..	223 .	Leadscrew Drive	193 .	38
09 ..	227 .	Linelock & Bell	326 .	51
24 ..	241 .	Magnet Selection		
18 ..	233 .	Mainspring & Cords	242 .	43
09 ..	226 .	Margin	326 .	51
11 ..	227 .	Motor & Drive	1 .	17
20 ..	235 .	Operational Feedback	322 .	51
12 ..	229 .	Operational Shaft		
26 ..	245 .	Out Of Paper Feature	292 .	48
26 ..	245 .	Paper Aligners	422 .	62
26 ..	244 .	Paper Feed	268 .	46
26 ..	245 .	A-Frame	280 .	47
28 ..	247 .	Pinfeed Platen	427 .	62
28 ..	246 .	Platens		
03 ..	220 .	Print	110 .	29
04 ..	222 .	Print Shaft Cover		
21 ..	236 .	Reverse Indexing	436 .	63
15 ..	231 .	Ribbon: Correcting	384 .	57
15 ..	231 .	End Of Ribbon	382 .	57
13 ..	230 .	Fabric	342 .	53
14 ..	230 .	Film	351 .	53
15 ..	232 .	Selective	361 .	54
02 ..	219 .	Rocker		
40 ..	254 .	Roll Paper Holders		
16 ..	233 .	Shift	42 .	22
24 ..	242 .	Solenoid Selection		
18 ..	233 .	Tab – MC	207 .	39
18 ..	234 .	E/MC	226 .	41
18 ..	235 .	MC II, MC/A, MEM/T, ESC, MCC	240 .	43
22 ..	238 .	Transmit Block	6 .	18
03 ..	221 .	Type Elements & Fonts		
25 ..	242 .	Velocity	129 .	31
35 ..	253 .	Velocity Control	40 .	22
		MC – E/MC READER/RECORDER		
74 ..	265 .	Auto – ID & Keylock		
52 ..	257 .	Card Drive	11 .	1
58 ..	259 .	Card Path	11 .	1
72 ..	264 .	Communicating Feature		
66 ..	263 .	Covers & Mounts	70 .	7
50 ..	257 .	Drive	1 .	1
60 ..	259 .	Electrical		
56 ..	258 .	Head & Carrier	50 .	5
50 ..	256 .	Motor	1 .	1
62 ..	260 .	Planar Package		
64 ..	262 .	Power Supply		
63 ..	260 .	SLD Feature Cards		
54 ..	258 .	Track Step	29 .	3
67 ..	263 .	Transcribing Unit		
		MC – E/MC PACKING		
80 ..	269 .	Planar Packing & Instructions		
80 ..	272 .	Pre-Packing & Instructions		
		MEM/T – ESC		
76 ..	267 .	Planar Package (WT)		
76 ..	267 .	Planar Package		
77 ..	268 .	Power Supply		
75 ..	265 .	Tape Loop	1 .	65
75 ..	266 .	External Tape Loop		
		MEM/T – ESC PACKING		
80 ..	270 .	Planar Packing & Instructions		
80 ..	271 .	Pre-Packing & Instructions		
		MC II, MC/A, MC II-C, MCC READER/RECORDER		
83 ..	276 .	Card Drive	4 .	10
87 ..	278 .	Card Path	4 .	10
88 ..	279 .	Card Stacker	54 .	14
92 ..	281 .	Communication Feature		
94 ..	283 .	Covers & Mounts	69 .	16
82 ..	275 .	Drive	1 .	10
90 ..	279 .	Electrical		
86 ..	277 .	Head & Carrier	44 .	13
82 ..	275 .	Motor	1 .	10
88 ..	278 .	Pack Feed	54 .	14
91 ..	280 .	Planar Package		
93 ..	282 .	Power Supply		
93 ..	282 .	Power Supply (WT)		
84 ..	276 .	Track Step	26 .	12
85 ..	277 .	Track 1 Return	33 .	12
		MC II, MC/A, MC II-C, MCC PACKING		
80 ..	269 .	Planar Packing & Instructions		
80 ..	273 .	Pre-Packing & Instructions		

CONTENTS
(Alphabetical)

DIAGNOSTIC	MC Page	E/MC Page	MC(CF) Page	MC II Page	MC/A Page	MEM/T Page	ESC Page	MCC Page
Adjust Conversion Chart	210	210	210	210	210	210		
Blown Fuse Check						166	182	
Board Zero Mag Head Test Procedure	84	84	84	122	122			122
CE Aids			108					
Character Chart		206						
Character Code Chart – WT	207	207		207	207	207		
Communicating Procedure			108					
Cycle Maintenance Procedure	211	212		213	213	214	216	214
Data Set – Cable And Connectors			103					
Data Set – Cable And Connectors - WT			103					
DC Volt. Distribution Diagram						168	183	
DC Volt. Distribution Diagram – WT							185	
Diagnostic Approach	68	68	68	68	68	68	68	
Edge Connector Location Chart	67	67	67	67	67	67	67	67
Error Diagnostic Chart Tape Loop						167		
Features – Cable Assemblies	111							
Features – Cable Assemblies – WT		89						
Font Layout Chart							188	
Format Feature				133	133			
Function Chart Symbols	210	210	210	210	210	210	210	
Function Charts								
Backspace	99	98		145	145	173	202	
Carrier Return	99	97		145	145	172	202	
Centering		98						
Character Selection	94	94		143	143	170	201	
Correcting Ribbon Cycle				146	146	173		
Dummy Character	92	92						
Dummy Cycle							203	
Eject	94	94		142	142			
Escapement		97		144	144	172	200	
Escapement Pitch Change							204	
Feed From Pack				142				
Index	95	95		145	145	171	203	
Keyboard	94	94		143	143	170	200	
Load	90	90		141	153			
Paragraph Indent	96	96						
Playback	93	93						
Printer Shift Cycle	95	95		144	144	171		
Read Error				141	152			
Read From Pack				139				
Read Track				140	140			
Recall						170		
Receive Mode			106					
Record	91	91		139	154			

DIAGNOSTIC	MC Page	E/MC Page	MC(CF) Page	MC II Page	MC/A Page	MEM/T Page	ESC Page	MCC Page
Record Error				140	153			
Record Track				140	140			
Reverse Index				146	146	173		
Shift	95	95		144	144	171	201	
Single Card Read				143	153			
Stack				142	142			
Standby Mode			107					
Store						169		
Tab	99	97		144	144	172	203	
Track 1 Return				142	142			
Track Step				142	142			
Track Step Down	90	90						
Track Step Up	90	90						
Transmit Mode			106					
Word Underscore		96						
Head Alignment Procedure	85	85	85	122	122			122
Installation Procedure	217	217	217	217	217	218	218	
Operating Instructions								
Access Buttons				123	123	175	192	
Additional Code							198	
Alternate Section				131				
Backspace							194	
Centering				126	126	176		
Column Instruction Code							196	
Decimal Tab				127	127	177		
Delete Functions				123	123	175	193	
Demo Text							199	
Entering Text Into Memory							193	
Font Selection							198	
Keyboarding Text				123	123	175		
Light/Error Conditions				132	154	174	199	
Line Count				125				
Line End Decisions							196	
Line Format Instruction							195	
Line Length				125	125	177		
Manual Velocity Control							197	
No Print							197	
Playback				124	124	177		
Primary Buttons							192	
Recall From Tape Loop						174		
Required Carrier Return							193	
Required Tab				127	127	176	195	
Section Clear							192	

CONTENTS
(Alphabetical)

DIAGNOSTIC	MC Page	E/MC Page	MC(CF) Page	MC II Page	MC/A Page	MEM/T Page	ESC Page	MCC Page
Store On Tape Loop						174		
Tab				127	127	176	194	
To Scan Text				128				
To Read A Card				125	152			
To Record A Card				124	152			
Unattended Printing				130				
Word Underscore				126	126	176		
Working With Memory				123	123	175	192	
Pin Jumper Chart – WT	110	109		121	121	121	186	
Planar Package Voltage Check	72	81	104	112	147	160	180	
Planar Package Voltage Check – WT			103					
Power Supply Check Procedure				118	118	166	182	
Print Quality Diagnostics							189	189
Quick Check	73			114	149	155	178	
System Busy Check	76	76				163	187	
System Unit Isolation Chart	76	76	76	76	76	76	76	76
Tape Loop Diagnostics – 50, 100						164		

DIAGNOSTIC	MC Page	E/MC Page	MC(CF) Page	MC II Page	MC/A Page	MEM/T Page	ESC Page	MCC Page
Track 51 Playout						158		
Transmit Block	205	205	205	205	205	205	187	187
Transmit Code & Selection Chart	205	205	205	205	205	205	188	188
Wiring Diagrams								
AC Wiring				119	119	169	184	
AC Wiring – WT				120	120	169	185	
Power Supply – Level 1	69	83	105	119	119			
– Level 2								
– WT	80	88	102	120	120			
Reader/Recorder – Level 1	69	69		112	147			
– Level 2	69	69						
– WT	77	86	100					
Tape Loop						165		
Typewriter (I/O) – Level 1	71	82		113	148	162	181	
– Level 2	70							
– Level 1 – WT	78	87	101					
– Level 2 – WT	79							

PLATEN INDEXING CHART

		24T	27T	31T	31T WTC	36T	45T	45T WTC	46T WTC	48T	48T WTC	51T WTC	54T	54T WTC
Ratchet		1164462	1164463	1175272	1175272	1159549	1175276	1175276	6512849	1175283	1175283	6512850.	1164464	1164464
Detent Asm.		1141561	1141767	1175273	1175273	1128975	1451925*	1128975	6512615*	1451925*	1175284	6512615*	1451925*	1451925*
Index Pawl Asm.		1128018	1128018	1128018	1128018	1128018	1141595	1128018	6512685	1141595	1128018	6512685	1141595	1141595
Line Space Lever**		1204283	1204283	1204283	1204283	1204283	1204283	1204283	1204284	1204283	1204284	1204284	1204284	1204284
Line Space Cam Lvr.		1141556	1128477	1128477	1128477	1128477	1141556	1128477	1141599	1141556	1128477	1141599	1141599	1141599
Index Selection Lever Positions														
1	Lines Per Inch	5.333	6.003	6.892	6.892	8.004	5.002	5.002	4.98†	5.333	5.333	4.46†	6.003	4.23†
	Teeth Indexed	1	1	1	1	1	2	2	2	2	2	2	2	2
2	Lines Per Inch	2.667	3.001	3.446	3.455	4.002	2.501	2.501	7.47†	2.667	2.667	6.68†	4.002	6.35†
	Teeth Indexed	2	2	2	2	2	4	4	3	4	4	3	3	3
3	Lines Per Inch								9.77†			4	3.001	8.47†
	Teeth Indexed								4			4	4	4

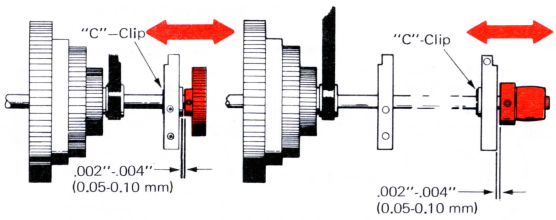
*Requires Detent Roller, P/N 1451926 & C-Clip, P/N 251989
**Line Space Lever, Memory Typewriter, P/N 1466671 and P/N 1470205 for 54T.

†Line Distance in mm.
See Appropriate Mechanism For Part Prices.

Code 32 Listing: See Part Number/ Price List, F/N 241-5585
Keyboard Layouts: See Type Catalog F/N 241-5687
Keybutton Listing: See Type Catalog F/N 241-5687
Platen Indexing Chart
Machine Identification
Code US/WT. 285
Cause Of Failure Codes. 285
Safety Precautions . . . Inside Cover

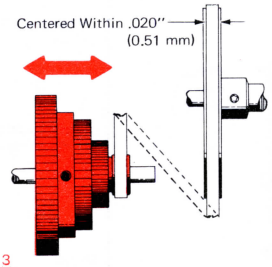
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1 Input Shaft End Play (50-144) (50-102)



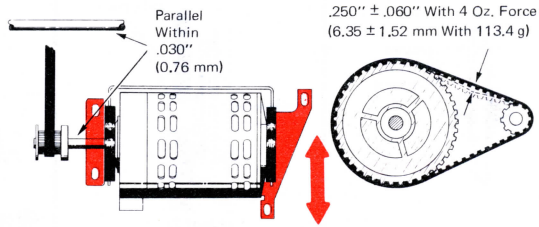
(Level 1) *(Level 2)*

2 Input Pulley (50-122)

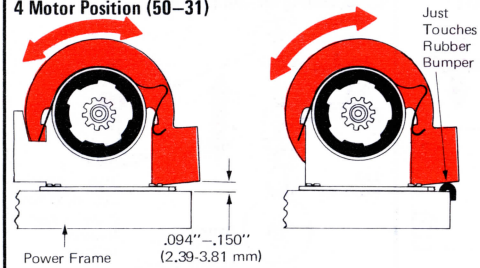


13

3 Motor Bracket Position (50-119)

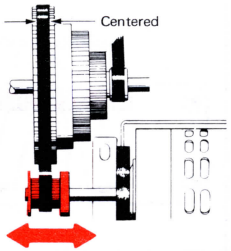


4 Motor Position (50–31)

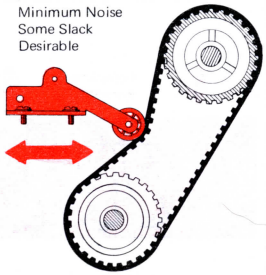


(Level 1) *(Level 2)*

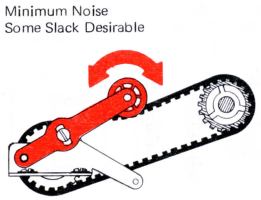
5 Motor Belt Tracking (50-15)



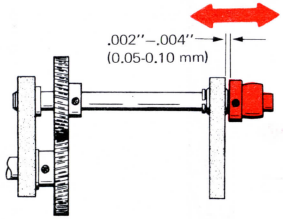
6 Head Drive Belt (50-137)



7 Return Belt Idler (50-136)

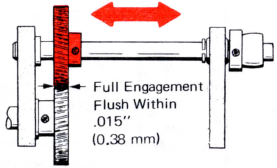


8 Forward Shaft End Play (50-102)



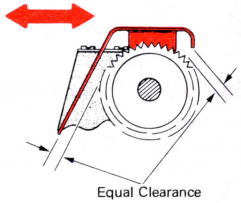
(Level 1 Only)

9 Forward Driven Gear (50–143)



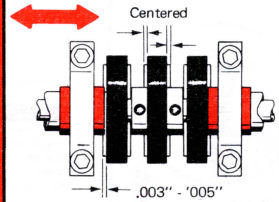
(Level 1 Only)

10 Forward Gear Guard (50-141)



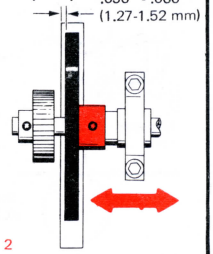
(Level 1 Only)

11 Drive Roller End Play (52-6)



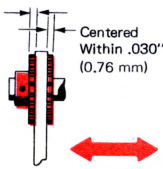
Note: Never Loosen Return Roller.

12 Reverse Flywheel (52-5)

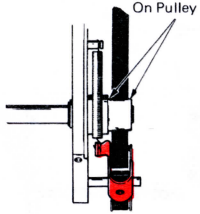


2

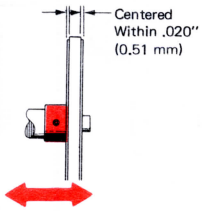
13 Return Drive Pulley (52–14)



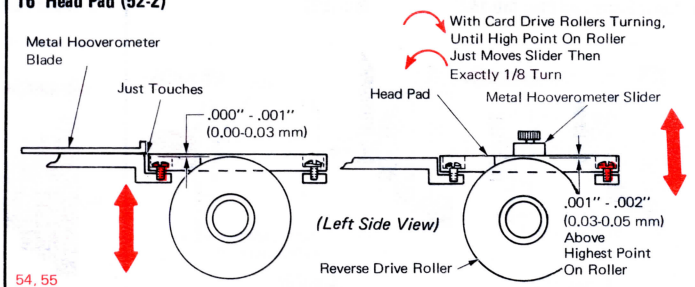
14 Forward Idler Arm (50-172)



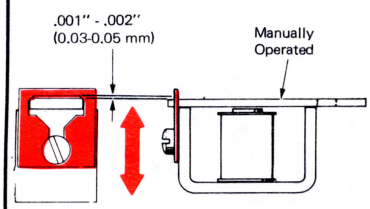
15 Forward Flywheel (52-5)



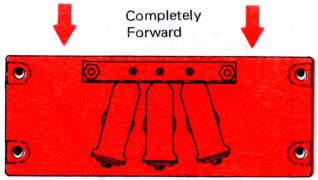
16 Head Pad (52-2)



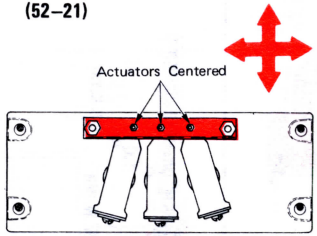
17 Card Drive Pivot Plate (52-32)



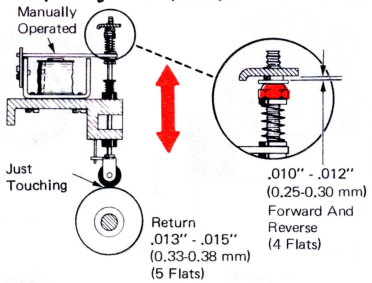
18 Magnet Assembly Position (52-17)



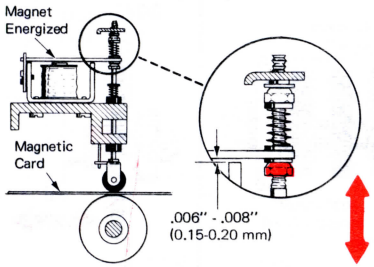
19 Magnet Assembly Upstop Bracket (52–21)



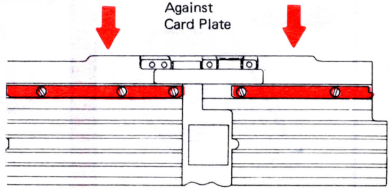
20 Operating Motion (52-16)



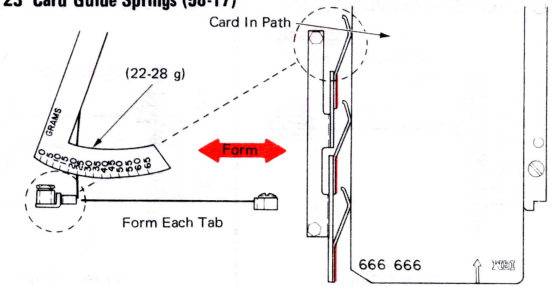
21 Armature Clearance (52-28)



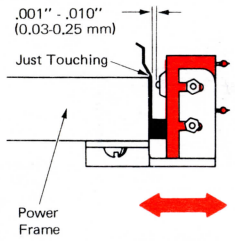
22 Fixed Rails (58-42) (58-16)



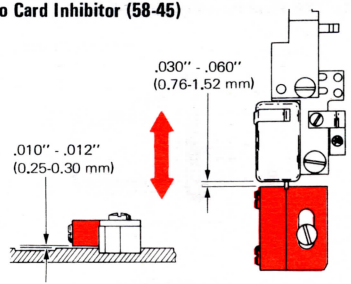
23 Card Guide Springs (58-17)



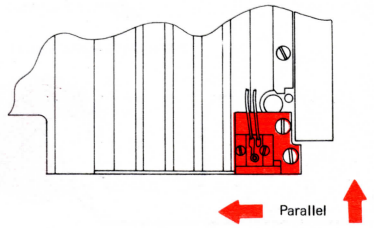
24 Two Card Switch (58-32)



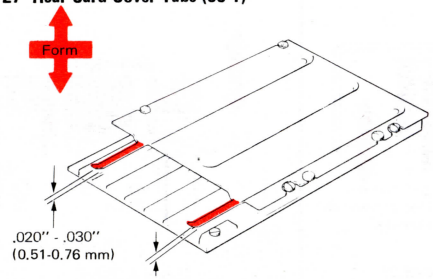
25 Two Card Inhibitor (58-45)



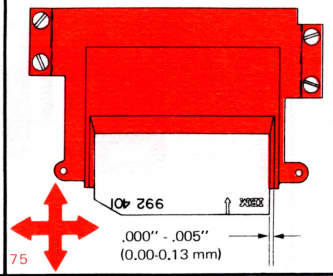
26 "E" Transistor Assembly (58-13)



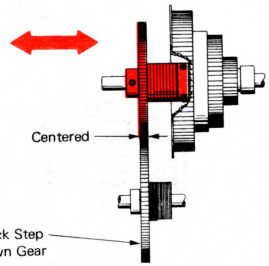
27 Rear Card Cover Tabs (58-1)



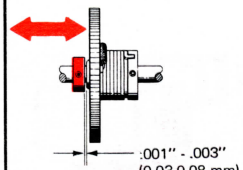
28 Card Throat (58-3)



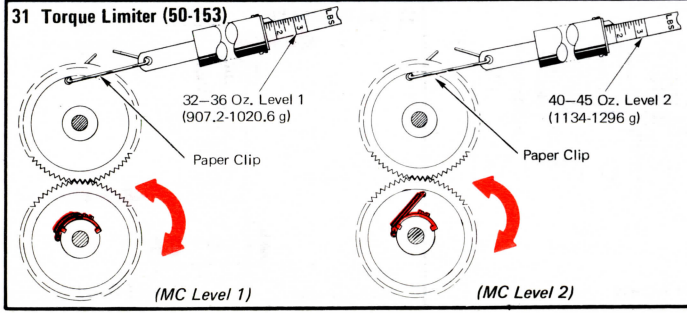
29 Torque Limiter Gear (50-126)



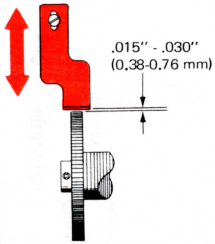
30 Torque Limiter End Play (50-127)



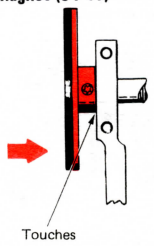
31 Torque Limiter (50-153)



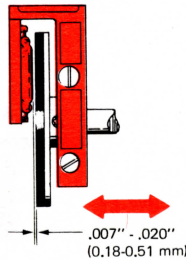
32 Torque Limiter Gear Guard (50-132)



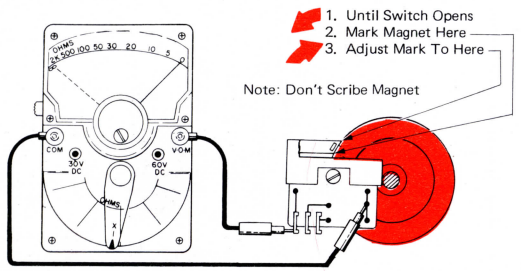
33 Track Step Feedback Magnet (54-41)



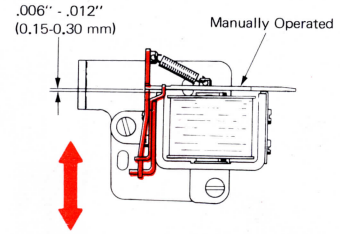
34 Switch Bracket (54-45)



35 Track Step Feedback Magnet (54-41)

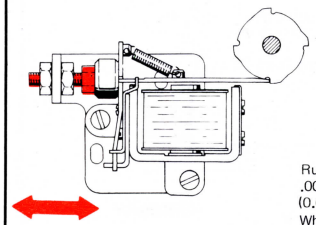


36 TSU Pivot Plate Position (54-54)



(Level 1 Only)

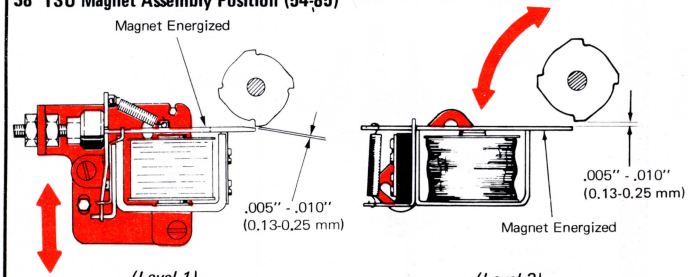
37 TSU Armature Shock Mount (54-54)



58

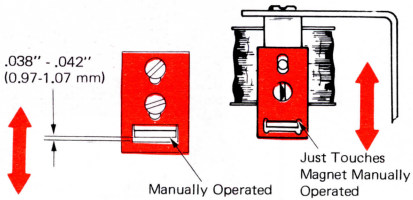
(Level 1 Only)

38 TSU Magnet Assembly Position (54-85)



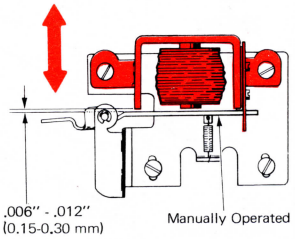
(Level 1) *(Level 2)*

39 TSD Armature Upstop (54–5)



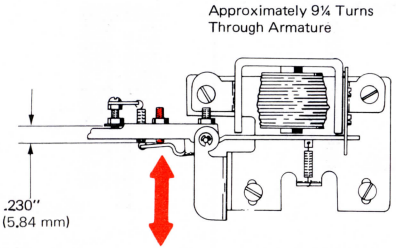
(Level 1) *(Level 2)*

40 TSD Magnet Position (54-6)



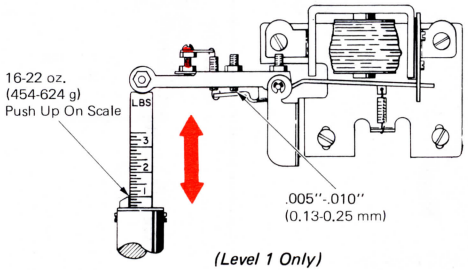
(Level 1 Only)

41 TSD Setscrew (54-80)



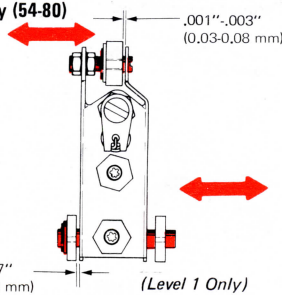
(Level 1 Only)

42 Relief Spring Tension (54-80)



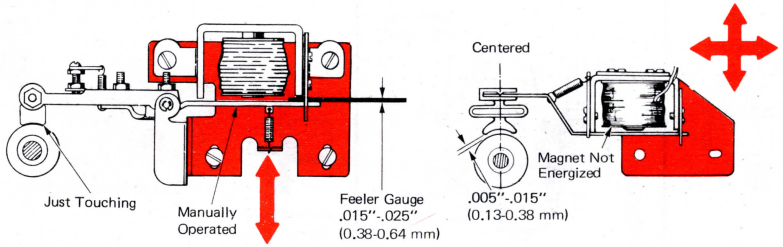
(Level 1 Only)

43 End Play (54-80)



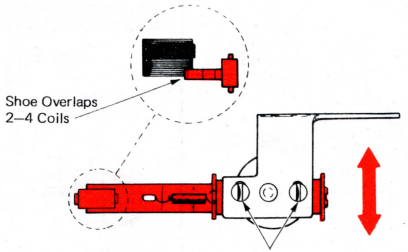
(Level 1 Only)

44 TSD Magnet Assembly Position (54-80)



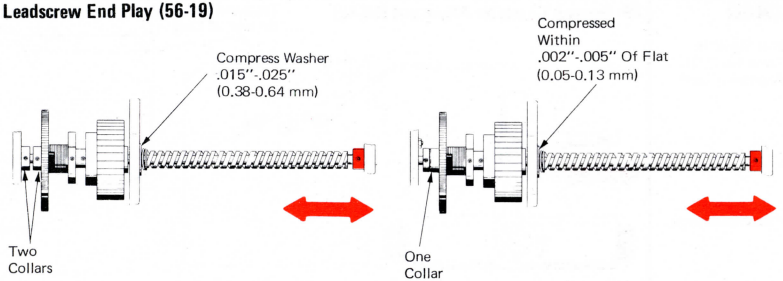
(Level 1) *(Level 2)*

45 TSD Shoe (54–10)



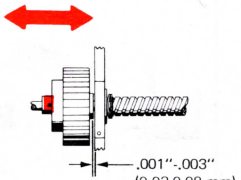
44 *(Level 2)*

46 Leadscrew End Play (56-19)

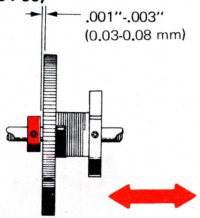


58 *(Level 1)* *(Level 2)*

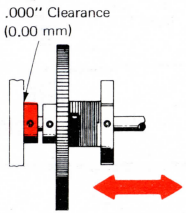
47 Slip Clutch End Play (54-21)



48 Arbor End Play (54-66)

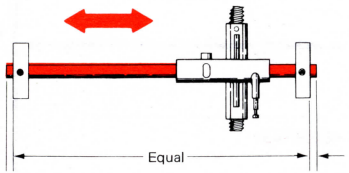


49 Bearing End Play (54-67)

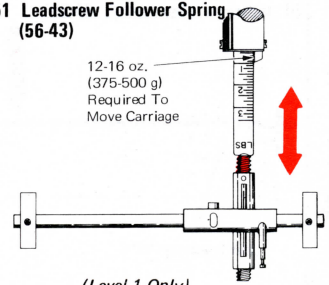


(Level 1 Only)

50 Head Carriage Guide Shaft (56-9)

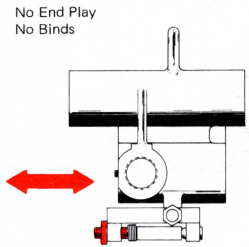


51 Leadscrew Follower Spring (56-43)

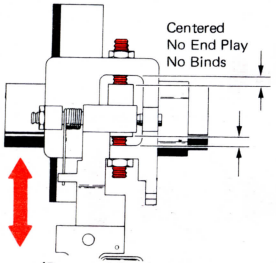


(Level 1 Only)

52 Head Pressure Pivots (56-54)

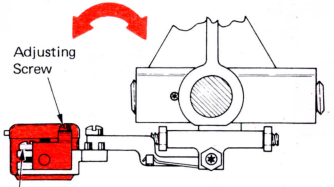


53 Head Roll Pivots (56-54)



54 Pitch (56–61)

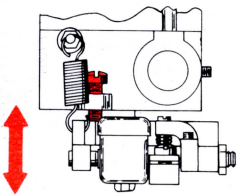
Adjust In Each Direction Until Signal Falls Off—Then Center



(See Head Alignment Procedure)

55 Roll (56-56)

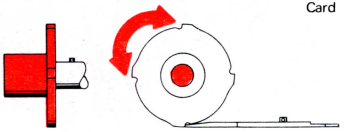
Adjust For Best Signal



(See Head Alignment Procedure)

56 Stop Latch Adjustment (Preliminary) (54-23)

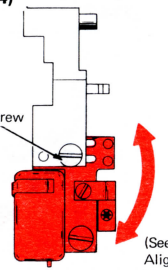
Best Signal In Track No. 3 Of Alignment Card



Maintain Left To Right Position

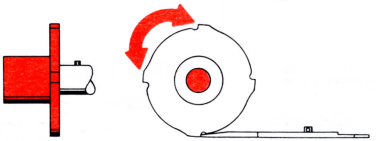
48 (See Head Alignment Procedure)

57 Skew (56-64)



58 Stop Latch Adjustment (Final) (54-23)

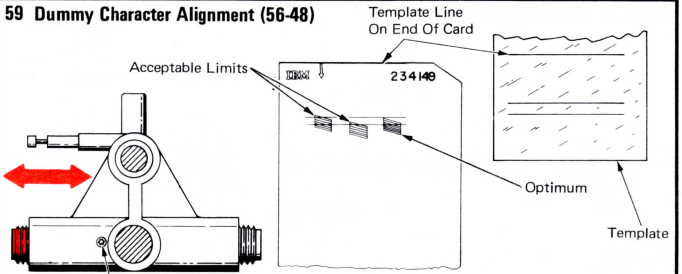
Best Signal In Track No. 3 Of Alignment Card



Maintain Left To Right Position

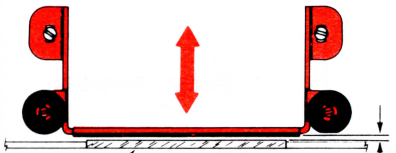
35, 48 (See Head Alignment Procedure)

59 Dummy Character Alignment (56-48)

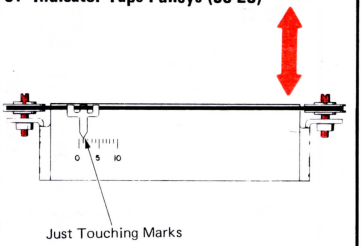


25, 51 (See Head Alignment Procedure)

60 Track Indicator Scale (56-24)

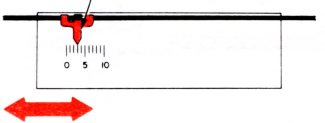


61 Indicator Tape Pulleys (56-23)

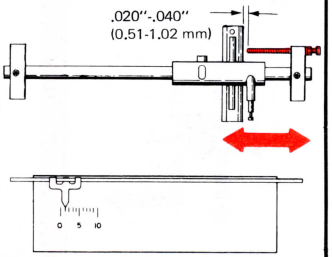


62 Track Position Pointer (56-68)

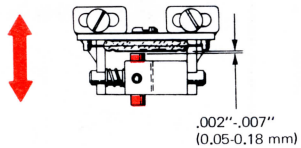
Centered On Three Head In Track No. 3 Of Alignment Card



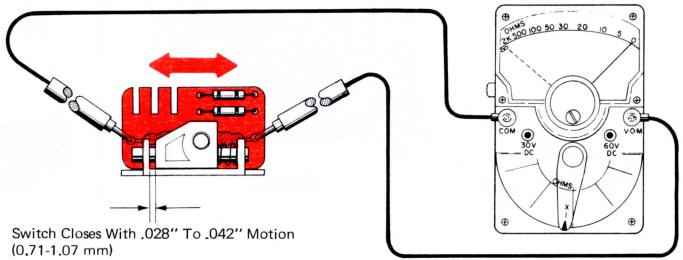
63 Head Carriage Stop Screw (56–12)



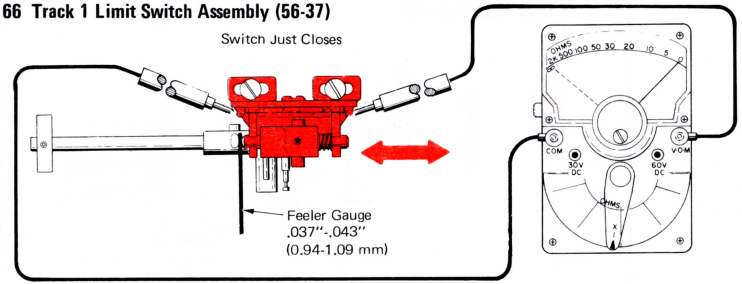
64 Track Limit Switch Magnets (56-33)



65 Track 1 Limit Switch Board (56-32)

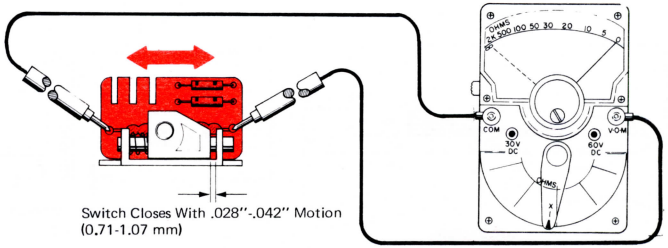


66 Track 1 Limit Switch Assembly (56-37)

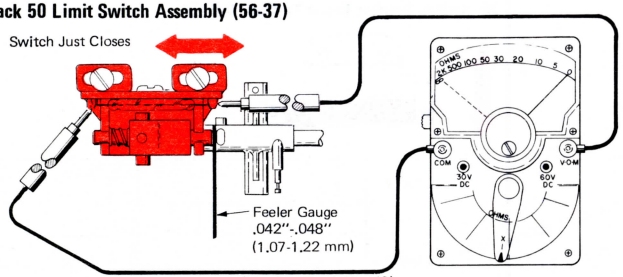


(Head In Track No. 2)

67 Track 50 Limit Switch Board (56-32)

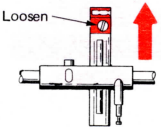


68 Track 50 Limit Switch Assembly (56-37)



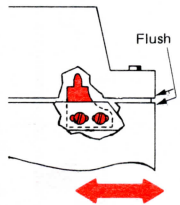
(Head In Track No. 49)

69 Head Leads Cable Clamp (56-70)

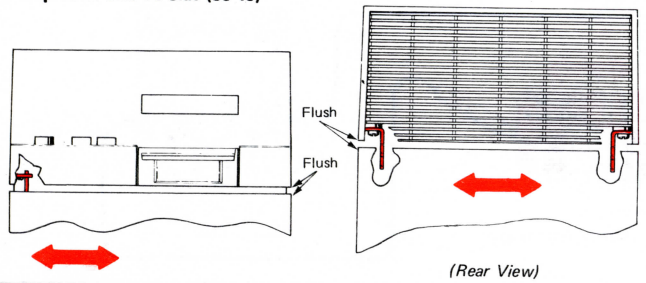


(Level 2)

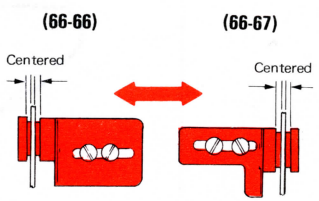
70 Top Cover Front-To-Rear (66-48)



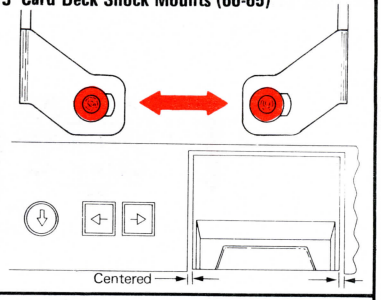
71 Top Cover Side-To-Side (66-48)



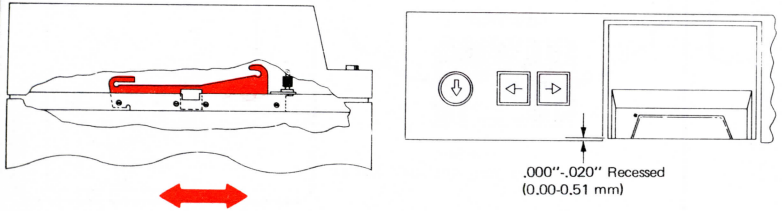
72 Card Deck Mounting Brackets



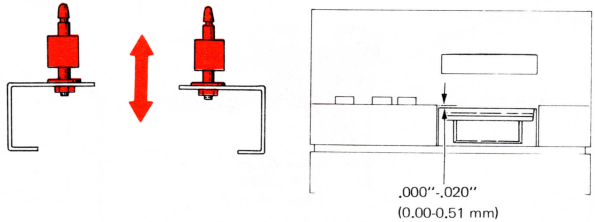
73 Card Deck Shock Mounts (66-65)



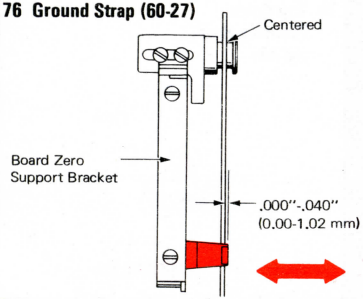
74 Card Deck Front-To-Rear (66-70)



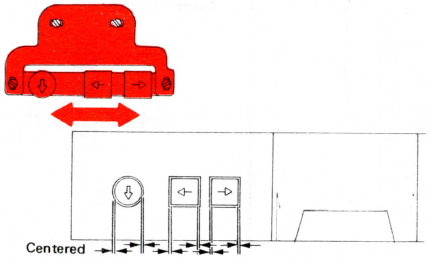
75 Card Deck Height (66-65)



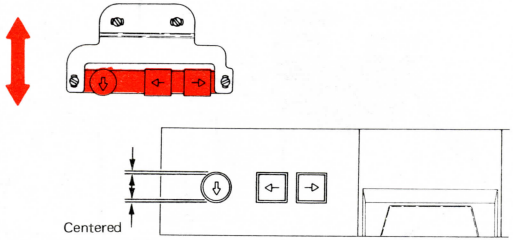
76 Ground Strap (60-27)



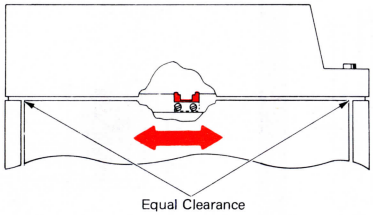
77 Switch Bracket Side-To-Side (60-28)



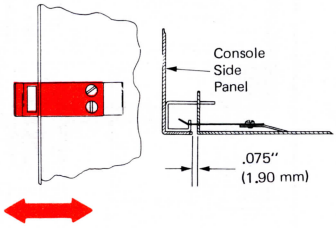
78 Switch Bracket Front-To-Rear (60-13)



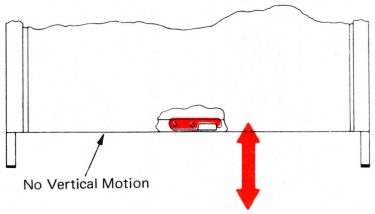
79 Side Panel Centering (66-21)



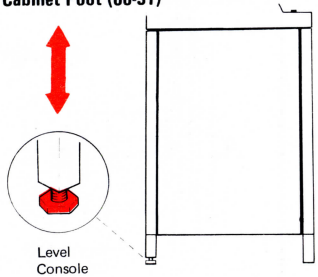
80 Side Panel Latch (66-29)



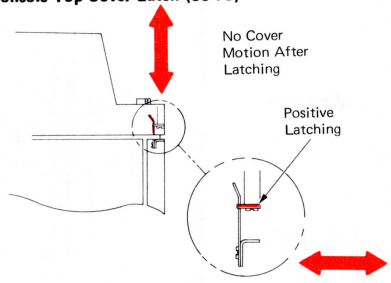
81 Side Panel Upstop (66-32)



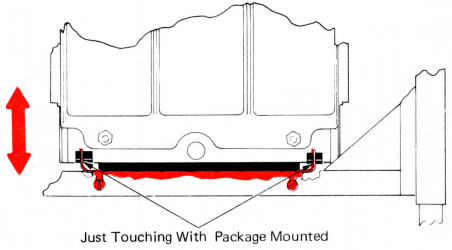
82 Rear Cabinet Foot (66-31)



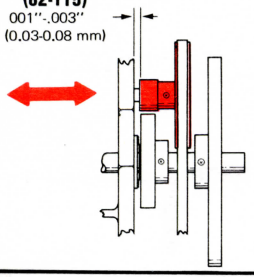
83 Console Top Cover Latch (66-79)



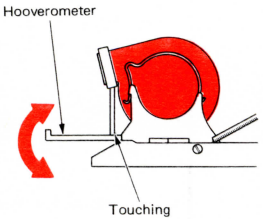
84 Planar Package Bottom Support (66-35)



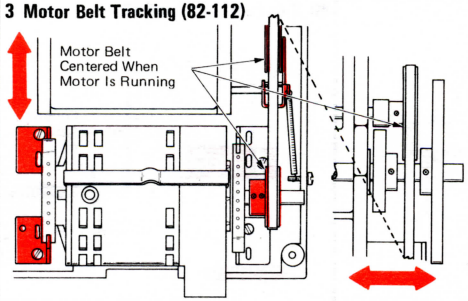
1 Auxiliary Shaft End Play (82-115)



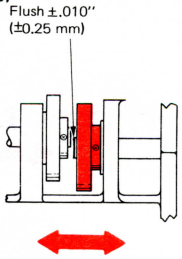
2 Motor Position (82-15)



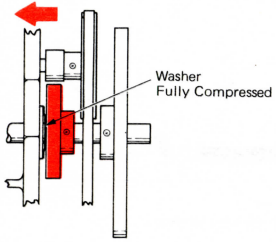
3 Motor Belt Tracking (82-112)



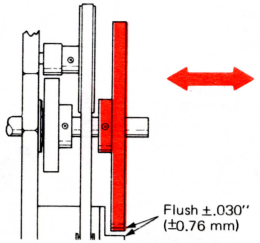
4 Forward Drive Roller (83-23)



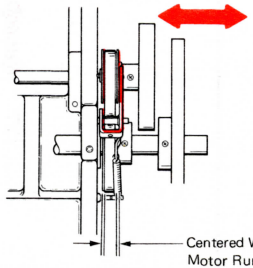
5 Forward Drive Shaft End Play (83-20)



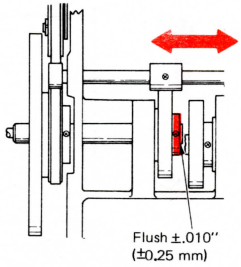
6 Forward Flywheel (83-19)



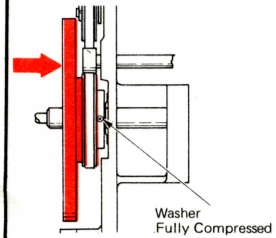
7 Forward Belt Idler (82-112)



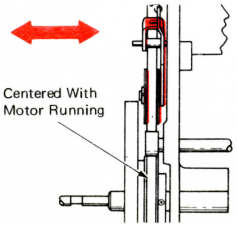
8 Reverse Drive Roller (83-23)



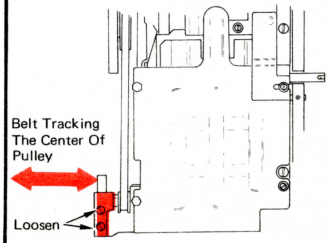
9 Reverse Drive Shaft End Play (83-27)



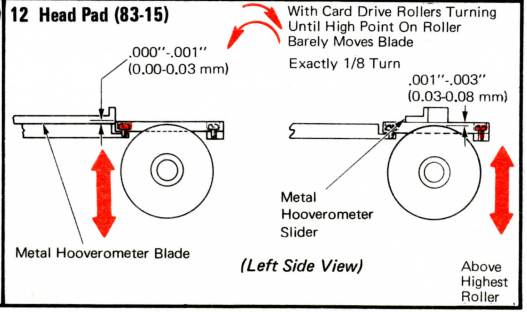
10 Reverse Belt Idler (82-107)



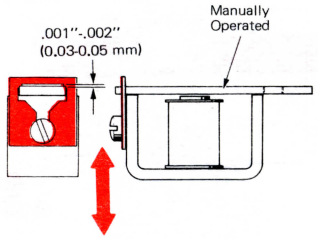
11 Reverse Drive Roller Idler Bracket (82-27)



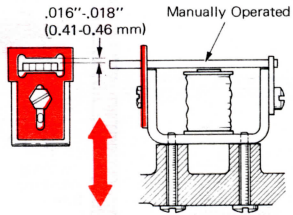
12 Head Pad (83-15)



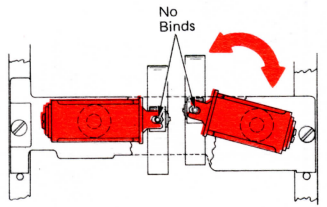
13 Card Drive Pivot Plate (83-7)



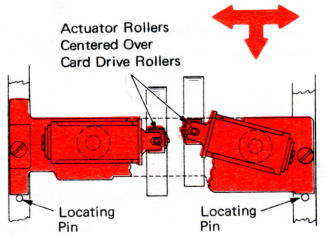
14 Card Drive Magnet Upstop (83-5)



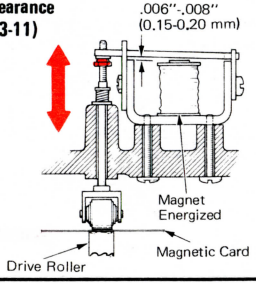
15 Card Drive Magnet Position (83-35)



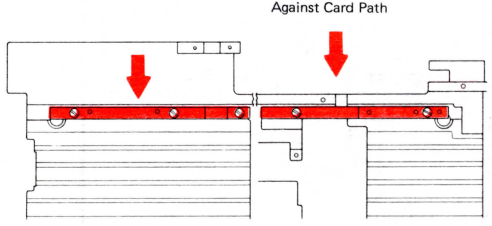
16 Magnet Assembly Position (83-9)



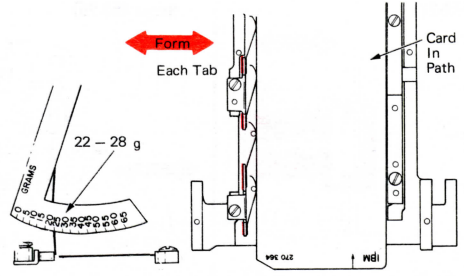
17 Card Drive Magnet Armature Clearance (83-11)



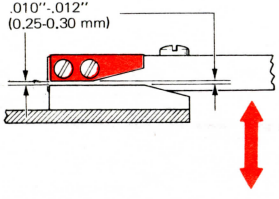
18 Fixed Rails (87-5) (87-4)



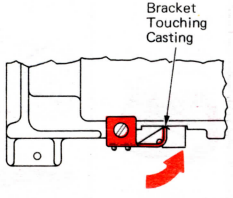
19 Card Guide Springs (87-11)



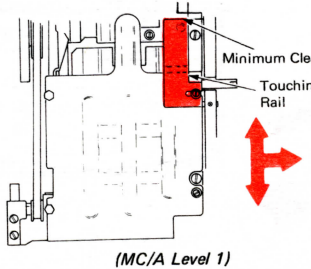
20 Two Card Inhibitor (87-17)



21 Two Card Stop (87-24)

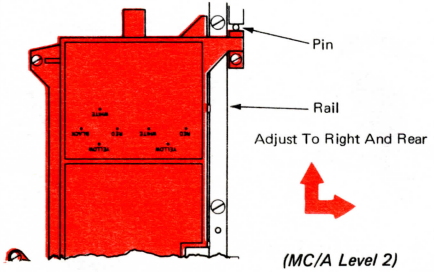


22 Front Card Guide Left To Right (87-33)



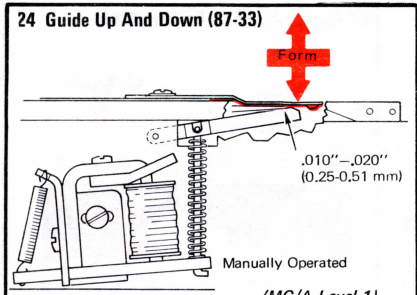
(MC/A Level 1)

23 Card Path Cover (87-33)



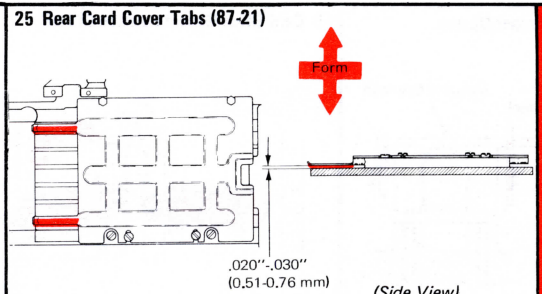
(MC/A Level 2)

24 Guide Up And Down (87-33)



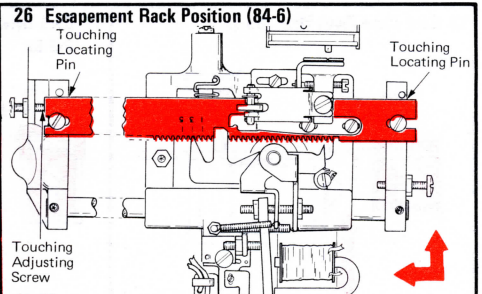
(MC/A Level 1)

25 Rear Card Cover Tabs (87-21)



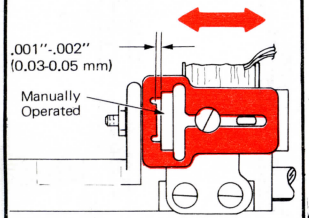
(Side View)

26 Escapement Rack Position (84-6)

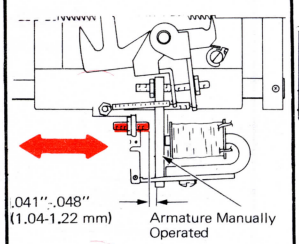


41, 52

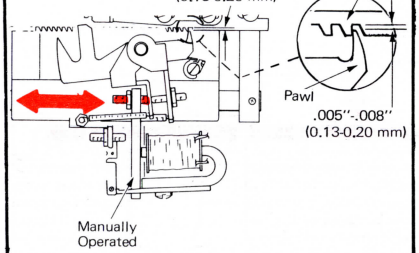
27 Track Step Magnet Pivot Plate (84-22)



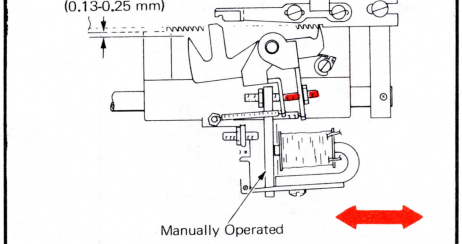
28 Track Step Magnet Upstop Screw (84-25)



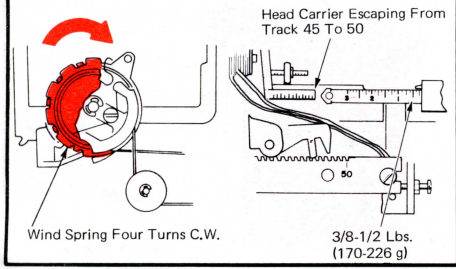
29 Check Pawl Clearance (84-10)



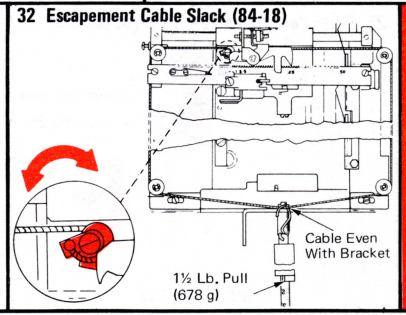
30 Track Step Escapement Pawl Clearance (84-29)



31 Escapement Tension Spring (84-37)



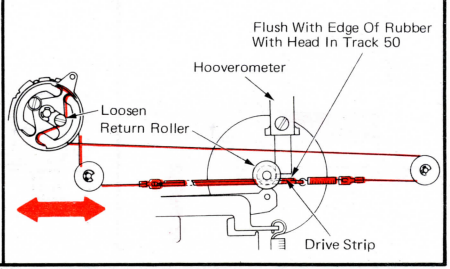
32 Escapement Cable Slack (84-18)



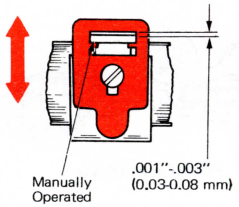
33 Cable Drum Position (84-35)



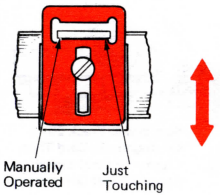
34 Drive Strip Position (85-6)



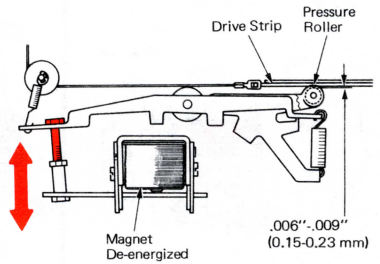
35 Track 1 Return Magnet Pivot Plate (85-15)



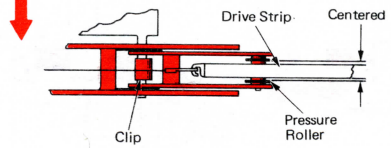
36 Track 1 Return Magnet Upstop (85-19)



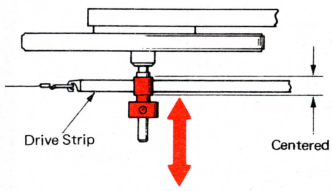
37 Pressure Roller Clearance (85-24)



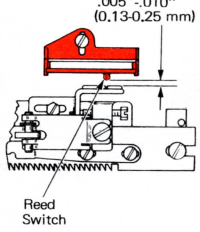
38 Pressure Roller Bracket (85-12)



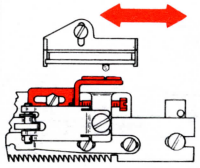
39 Return Roller (85-26)



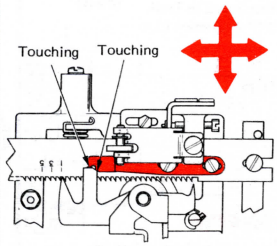
40 Track 1 Limit Switch (90-8)



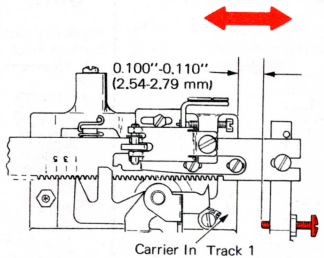
41 Track 1 Magnet Assembly (86-5)



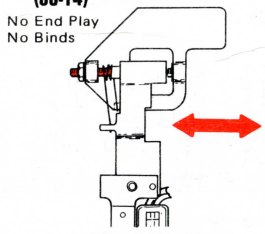
42 Track 1 Entry Guide (84-8)



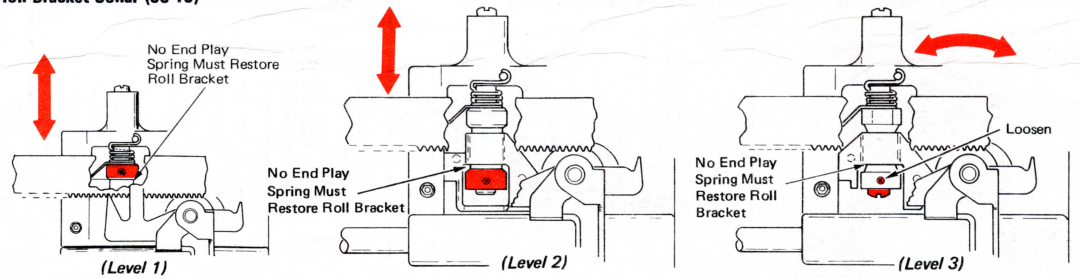
43 Overbank Stop Screw (86-52)



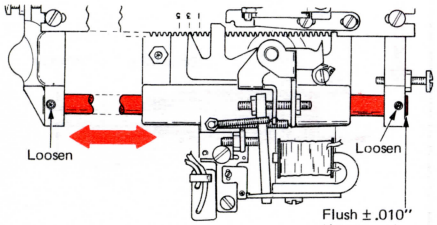
44 Pressure Plate Pivots (86-14)



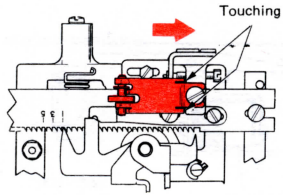
45 Roll Bracket Collar (86-10)



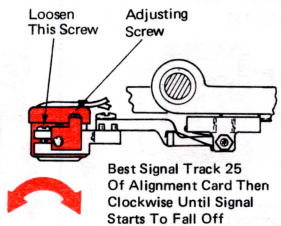
46 Head Carriage Guide Shaft (86-8)



47 Head Carriage Bias Roller (86-3)

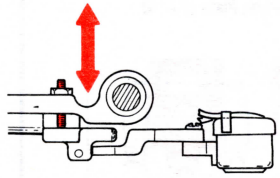


48 Pitch (86-18)



(See Head Alignment Procedure)

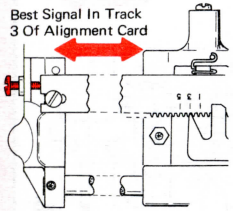
49 Roll (86-31)



Adjust For Best Signal

(See Head Alignment Procedure)

50 Across The Card (Preliminary) (84-6)



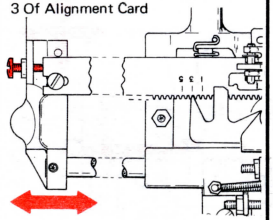
(See Head Alignment Procedure)

51 Skew (86-21)



(See Head Alignment Procedure)

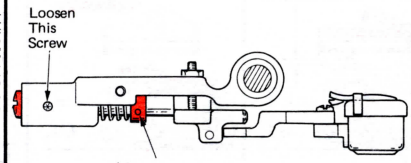
52 Across The Card (Final) (84-6)

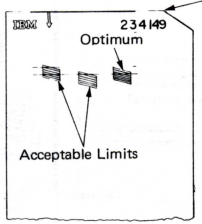


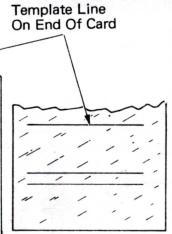
(See Head Alignment Procedure)

41, 26

53 Dummy Character Alignment (86-47)

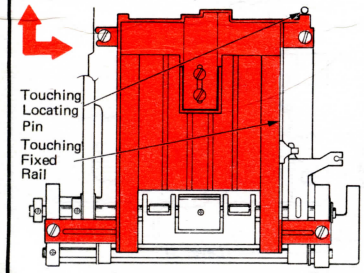




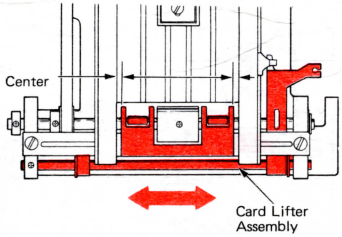


(See Head Alignment Procedure)

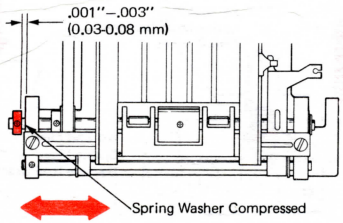
54 Pack Feed Assembly Position (88-39)



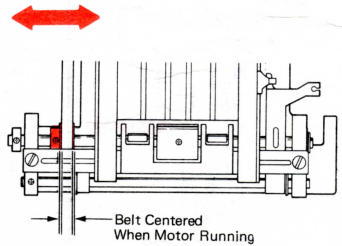
55 Card Lifter Position (88-29)



56 Pack Feed Drive Shaft End Play (88-33)

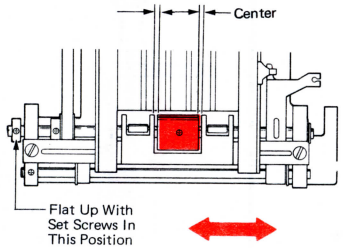


57 Pack Feed Drive Pulley (88-31)

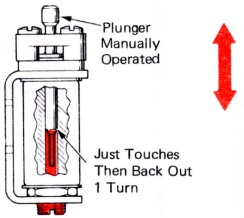


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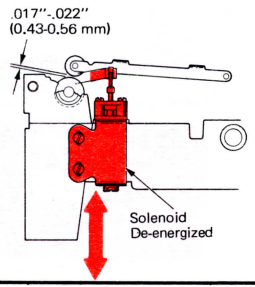
58 Pack Feed Roller (88-26)



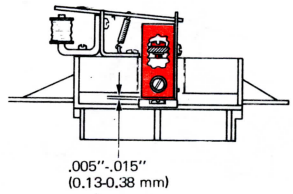
59 Lifter Solenoid Core (88-18)



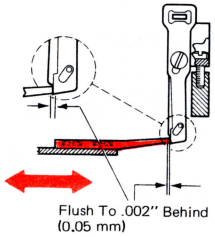
60 Lifter Solenoid Position (88–16)



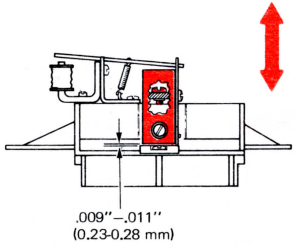
61 Pack Feed Knife (Preliminary) (88-60)



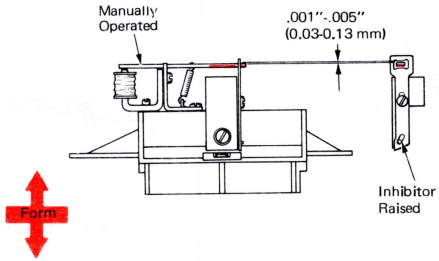
62 Pack Feed Ramp (88-8)



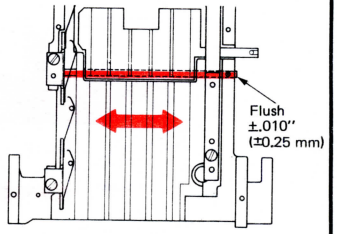
63 Pack Feed Knife (Final) (88-60)



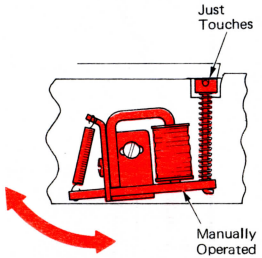
64 Inhibitor Magnet Armature (88-2)



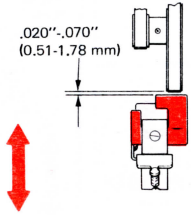
65 Gate Pivot Shaft (88–123)



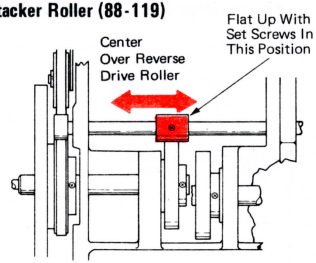
66 Gate Magnet Position (88-106)



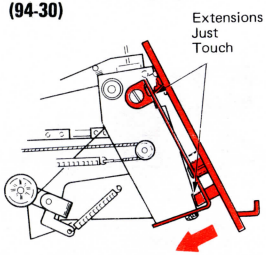
67 Auxiliary Pulley Guard (88-110)



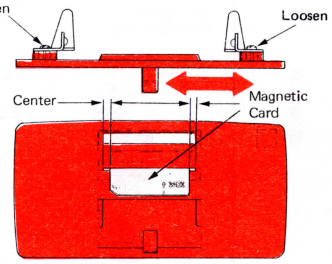
68 Stacker Roller (88-119)



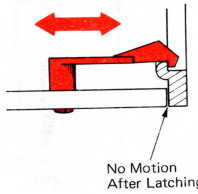
69 Faceplate Mounting Bracket (94-30)



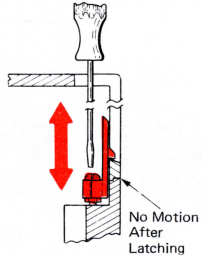
70 Faceplate Left-To-Right (94–30)



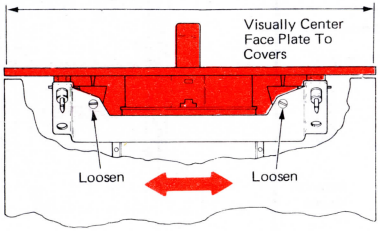
71 Side Cover Latches (94-22)



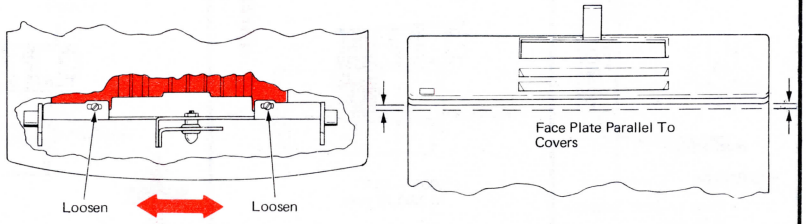
72 Top Cover Latch (94–18)



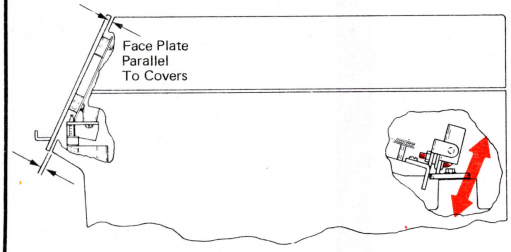
73 Card Deck Side-To-Side (94–41)



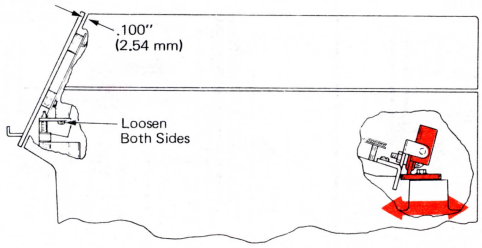
74 Card Deck Parallel – Horizontal (94-5)



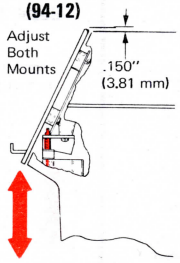
75 Card Deck Parallel – Vertical (94-4)



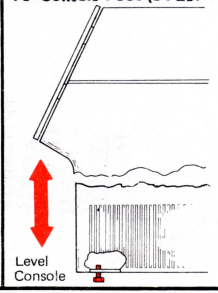
76 Card Deck Front-To-Rear (94-20)



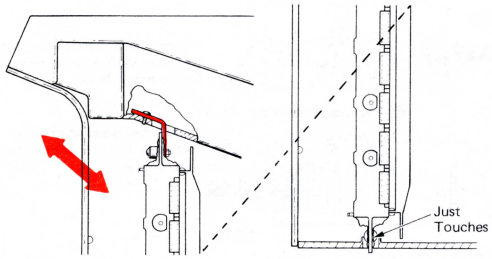
77 Card Deck Height (94-12)



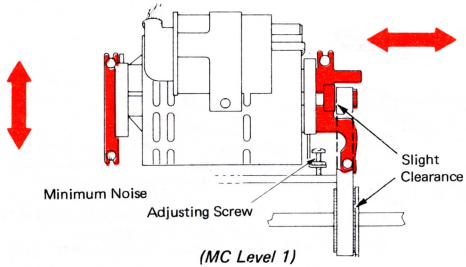
78 Console Foot (94-25)



79 Planar Package Mounting Bracket (94-34)

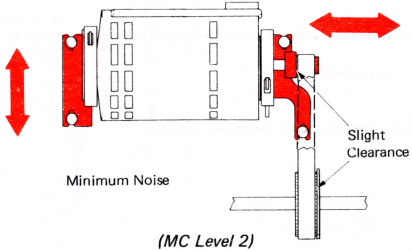


1 Drive Belt (11-5)



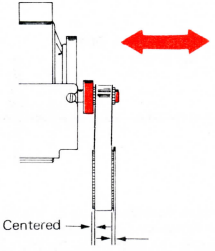
(MC Level 1)

(11-5)



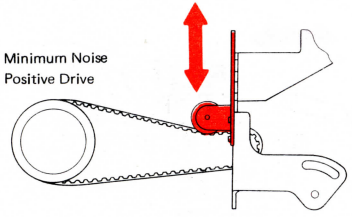
(MC Level 2)

(11-207)



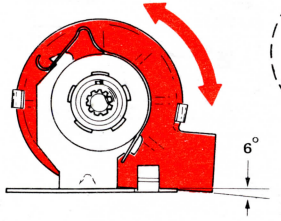
(E/MC, MC II, MC/A, Mem/T, E.S.C., MCC)

2 Drive Belt Idler (11-223)

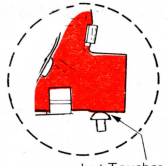


(E/MC, MC II, MC/A, Mem/T, E.S.C., MCC)

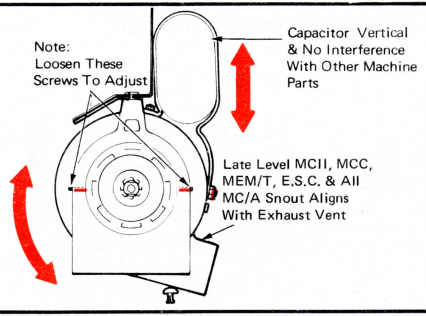
3 Motor Rotational (11-1)



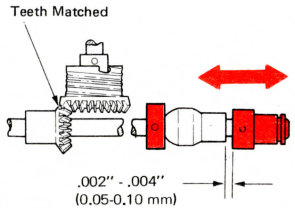
(MC)



(E/MC, MC II)

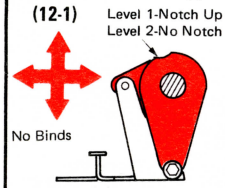


4 Operational Shaft End Play (12-7)



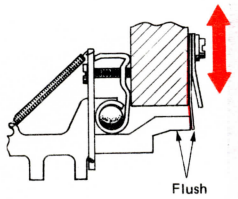
242

5 Operational Shaft Support (12-1)



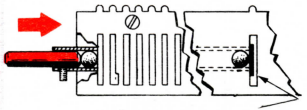
(MC)

6 Interposer Latch Spring (22-45)



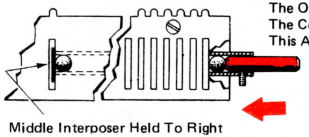
Check That The Keyboard Is Tightly Connected To The Power Frame

7 Compensator Tube (22-6)



Rotate The End Plugs To Avoid Retightening The Setscrews Into Earlier Screw Marks

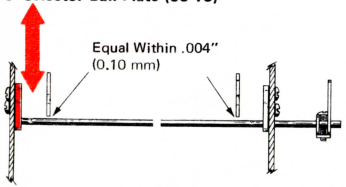
Middle Interposer Held To Left



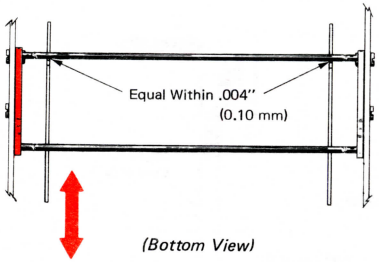
The On/Off Interposer Must Clear The Compensator Tube Before Making This Adjustment

Middle Interposer Held To Right

8 Selector Bail Plate (08-19)

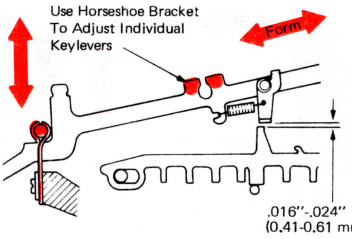


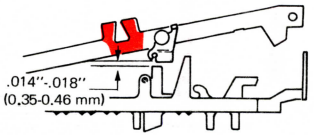
Never Loosen Both End Plates At The Same Time. Vertical Adjustment Can Normally Be Corrected By Loosening The Rear Screw On The Left Plate. Tap The Plate Up Or Down & Tighten.



(Bottom View)

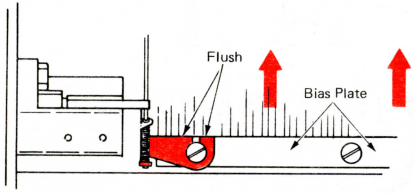
9 Front Keylever Guide Comb (22-26)



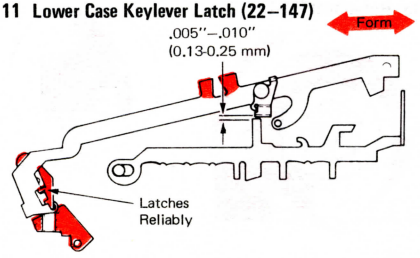


The Upper Case Keylever Is Adjusted For .014"-.018" (0.35-0.46 mm) The Optimum Clearance Is .016" (0.41 mm)

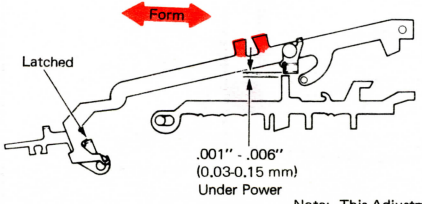
10 L.C. Shift Keylever Spring Anchor (22-34)



11 Lower Case Keylever Latch (22–147)



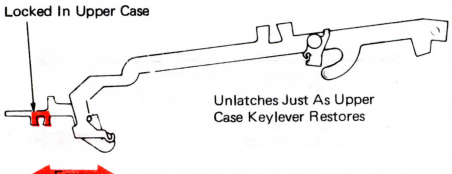
(MC Level 1)



(MC Level 2–E/MC, MC II, MC/A, Mem/T, E.S.C., MCC)

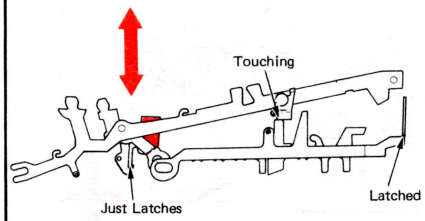
Note: This Adjustment Will Affect Lower Case Keylever Latch Overthrow.

12 Lower Case Keylever Latch Bite (22-165)

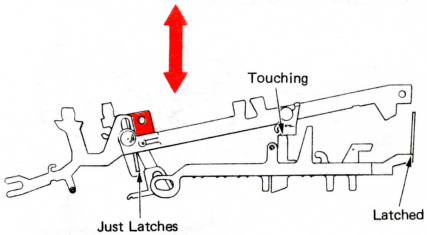


(MC Level 2—E/MC, MC II, MC/A, Mem/T, E.S.C., MCC)

13 Shift Lock (22-141)

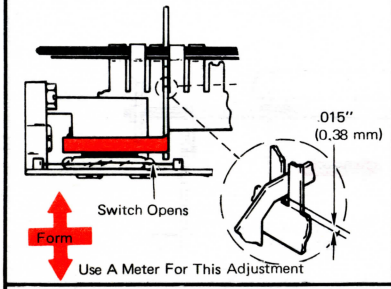


(MC Level 1)

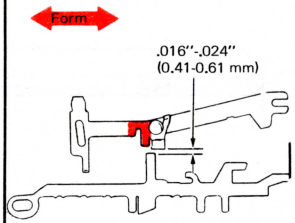


(MC Level 2—E/MC, MC II, MC/A, Mem/T, E.S.C., MCC)

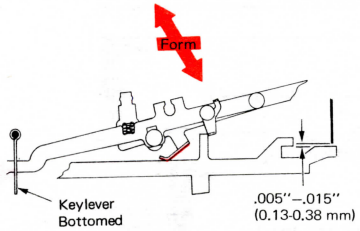
14 Keyboard Mode Switch Shunt (22—147)



15 Index Keylever (22—109)

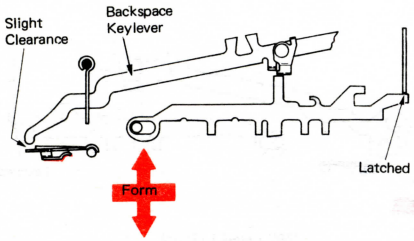


16 Repeat Keylever (22—18)



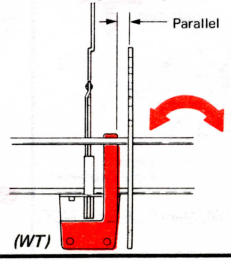
(MC Level 1)

17 B/S And C/R Repeat Bail (22—162)



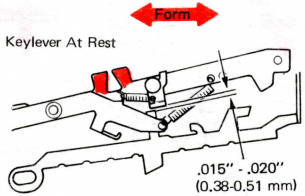
(MC Level 1 Only)

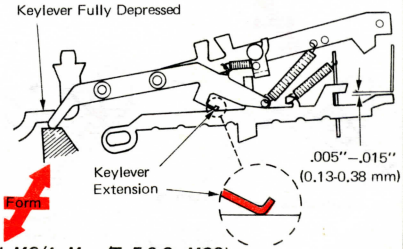
Cycle Bail Damper Spring (WT 96 Char.) (08—201)



(WT)

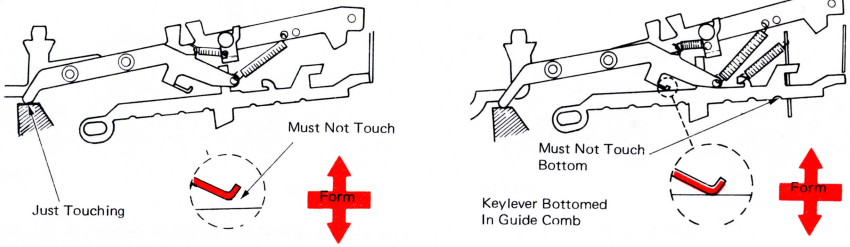
18 Repeat Keylever (22-18)



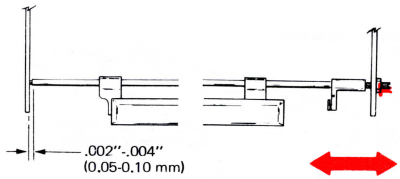


(MC Level 2—E/MC, MC II, MC/A, Mem/T, E.S.C., MCC)

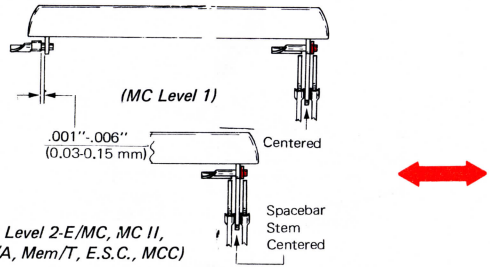
19 Repeat Keylever WTC (22-71)



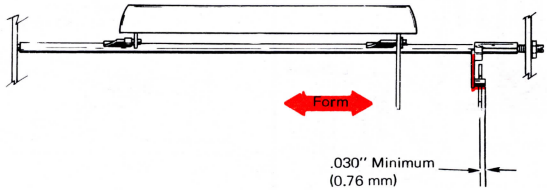
20 Spacebar Shaft (22-119)



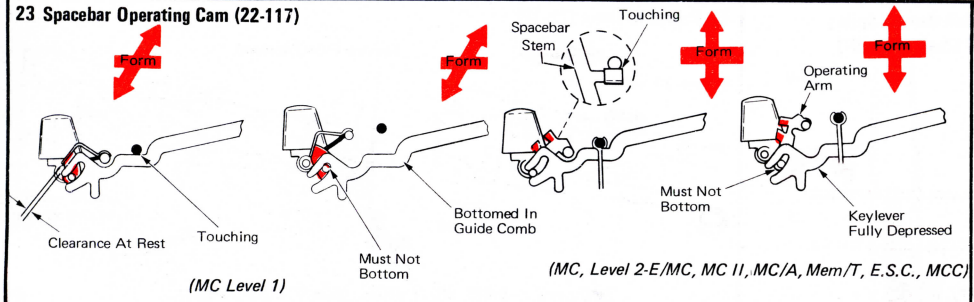
21 Spacebar End Play (22-115)



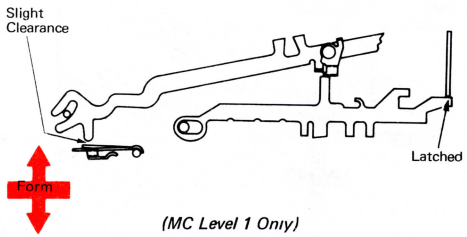
22 Spacebar Operating Arm (22-117)



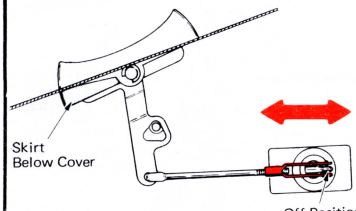
23 Spacebar Operating Cam (22-117)



24 Spacebar Repeat Lug (22-162)



25 On/Off Switch Link (11-16)

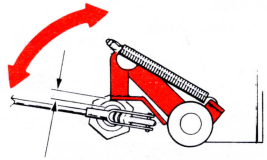


26 Keyboard Lock (9-261)



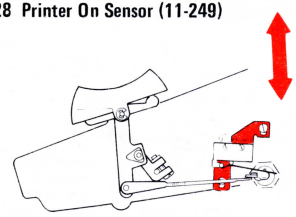
The On/Off Interposer Must Clear The Compensator Tube With The Switch In The On Position

27 On/Off Switch Stiffener (11-247)



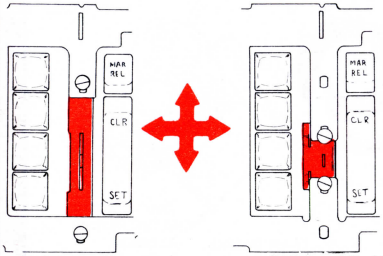
(MC II, MCA, MEM/T)

28 Printer On Sensor (11-249)

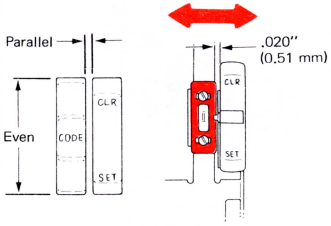


(E.S.C.)

29 Code Switch (22-331)

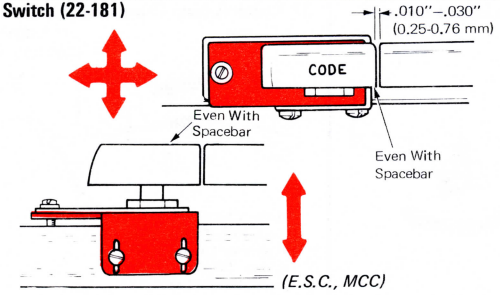


(MC Level 1) *(MC Level 2—MC II, MC/A, MEM/T)*



(E/MC Only)

30 Code Switch (22-181)



(E.S.C., MCC)

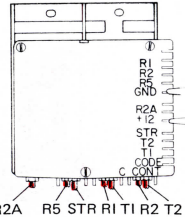
31 Transmit Block Stop Screw (22-250)

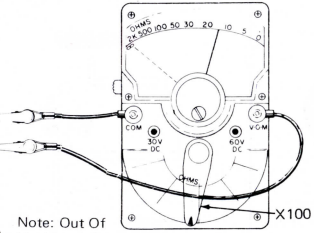
Selection

1. Switch Makes
2. One Turn

Strobe

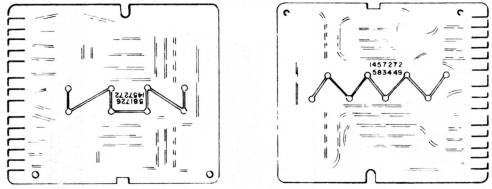
1. Switch Makes
2. 2 1/4 Turns





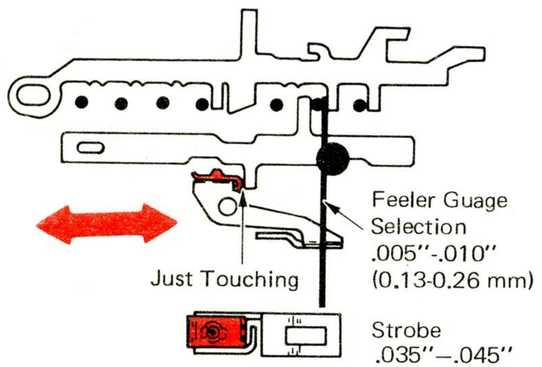
Note: Out Of Machine Adjustment Loosen Interposer Adjusting Screws Before Making This Adjustment

(Level 1) *(Level 2)*



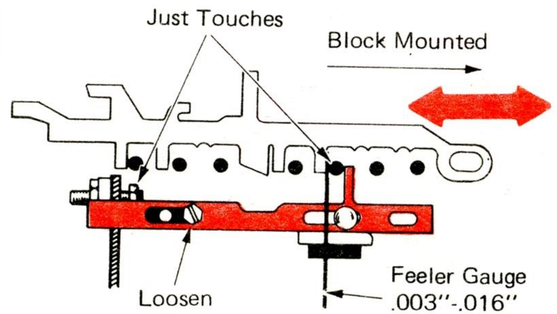
NOTE: Level Two Switches Should Open Within 3/4 Turn. Some Level One Switches May Open Within 3/4 And 1 Turn. If This Occurs, Adjust The Individual Switches Out 1 1/4 Turns.

32 Transmit Shunt (22-225)



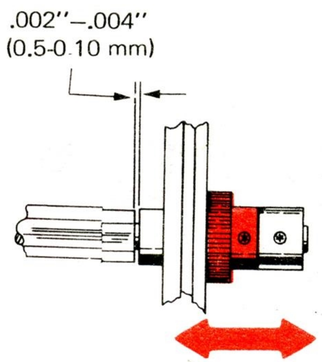
(MC Level 1)

33 All Transmit Block Interposer (22-225)

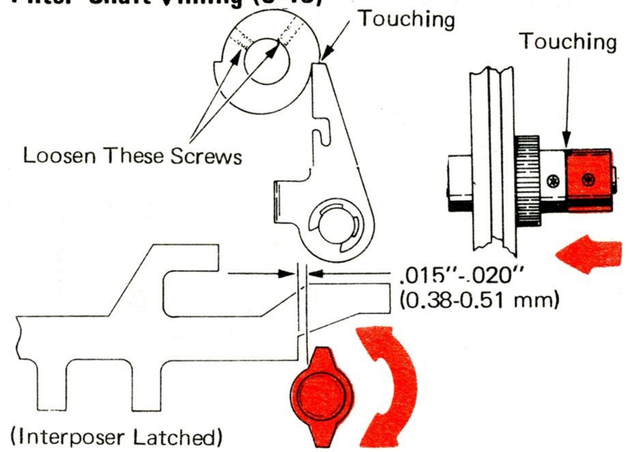


(MC Level 2—MCC, E/MC, MC II, MC/A, Mem/T, E.S.C.)

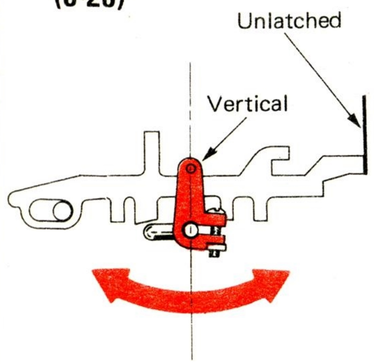
34 Filter Shaft End Play (8-32)



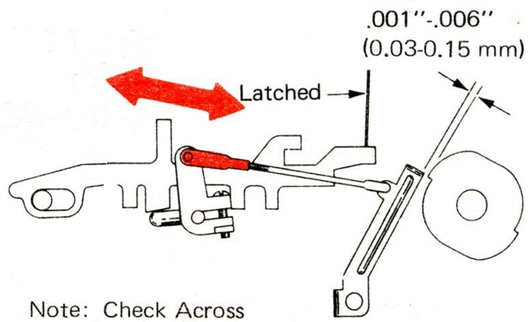
35 Filter Shaft Timing (8-45)



36 Clutch Release Bellcrank (8-26)



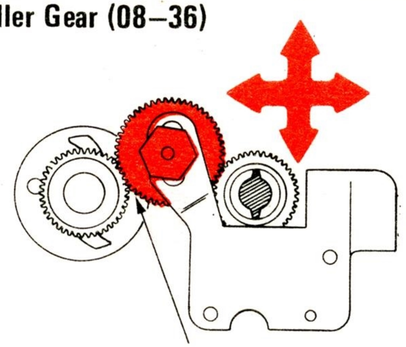
37 Clutch Release Clearance (8-29)



Note: Check Across Keyboard. Refine Interposer Latch Spring. Check On Both Sides Of Cam

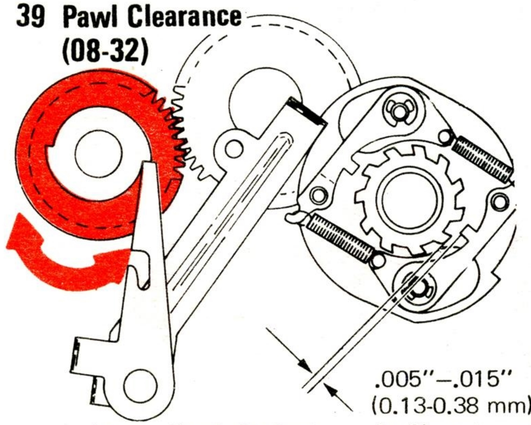
6

38 FSC Idler Gear (08—36)



.001"-.006"
(0.03-0.15 mm)
Backlash

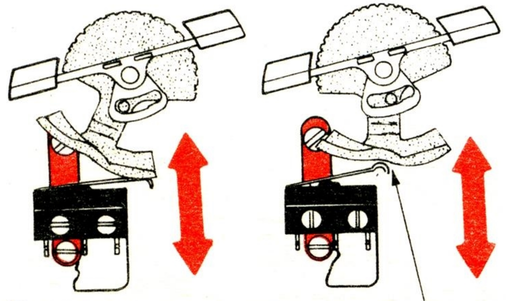
39 Pawl Clearance (08-32)



Note: Check On Both Sides of Cam

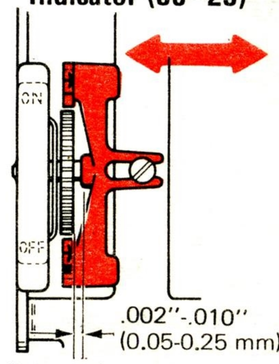
34

40 Velocity Control And Dead Key Inhibitor (35-22)



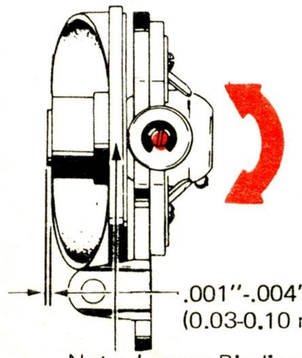
(MC, E/MC, MC II, MC/A, Mem/T)

41 Velocity Control Indicator (35—23)



(MC, E/MC, MC II, MC/A, Mem/T)

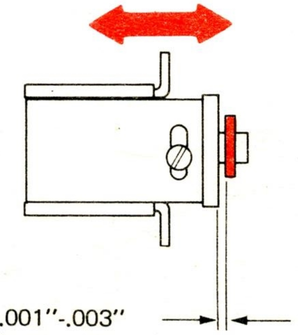
42 Shift Cam Backup Roller (16-51)



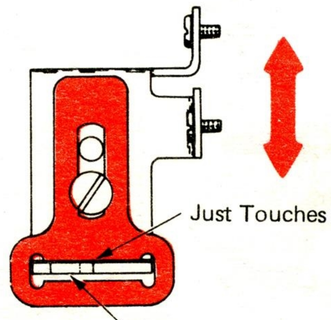
Note: Loosen Binding Set Screw Before Adjusting

4, 90

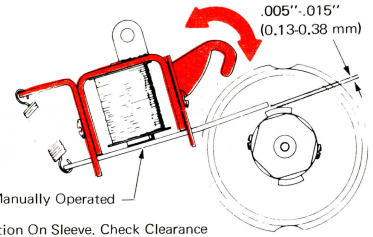
43 Shift Sleeve End Play (16—23)



44 Shift Magnet Upstop (16—33)

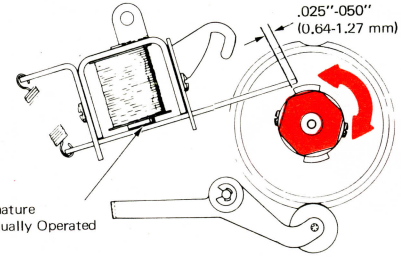


45 Shift Magnet Bracket (16-37)

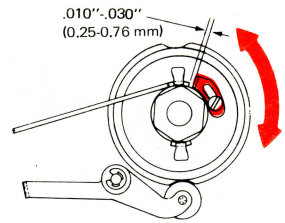


Note: No Lubrication On Sleeve. Check Clearance In Both Upper And Lower Case.

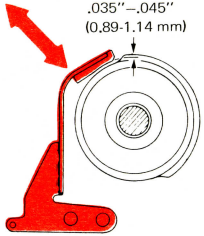
46 Shift Clutch Sleeve (16-22)



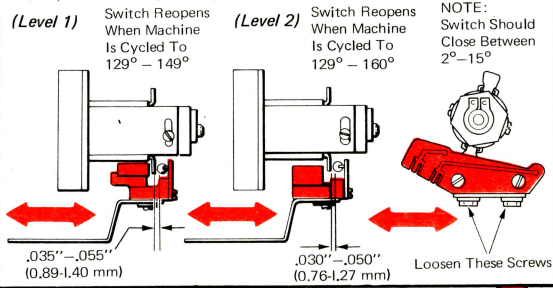
47 Shift Overthrow Stop (16–13)



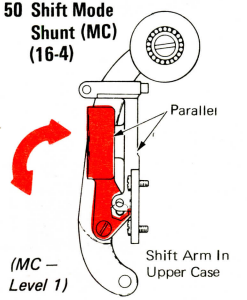
48 Shift Cam Brake (16–45)



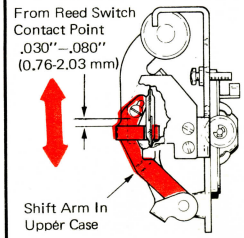
49 Shift Feedback (16–26) (16-25)



50 Shift Mode Shunt (MC) (16-4)

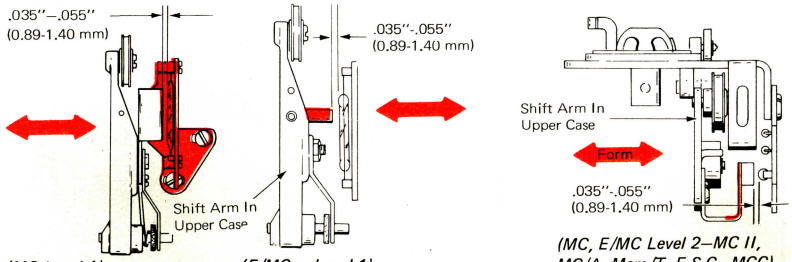


51 Magnet Position (16-83)



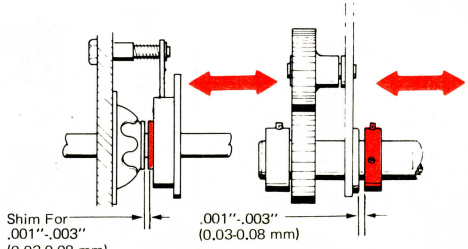
(MC, E/MC Level 2–MC II, MC/A, Mem/T, E.S.C., MCC)

52 Shift Mode (16-68) (16–73) (16-83)



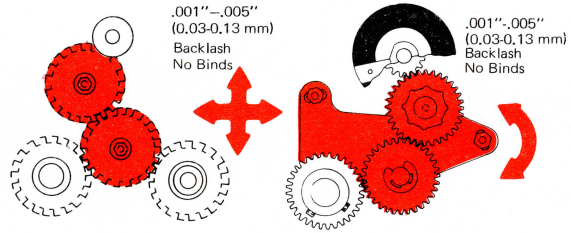
(MC Level 1) *(E/MC – Level 1)* *(MC, E/MC Level 2–MC II, MC/A, Mem/T, E.S.C., MCC)*

53 Cycle Shaft End Play (24-401)



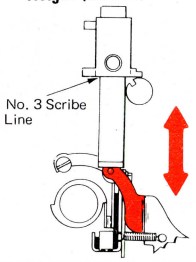
(MC, E/MC) *(MC II, MC/A, Mem/T, E.S.C., MCC)*

54 Idler Gears (24-264) (24-409)

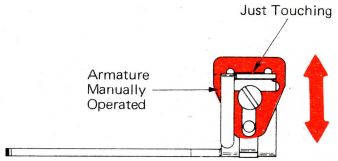


133 (MC) (E/MC, MC II, MC/A, Mem/T, E.S.C., MCC)

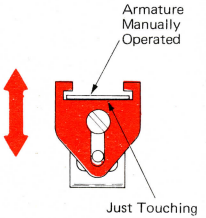
55 Cycle Clutch Latch Height (24-291)



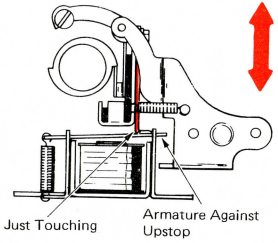
56 Cycle Clutch Armature Pivot Plate (24-235)



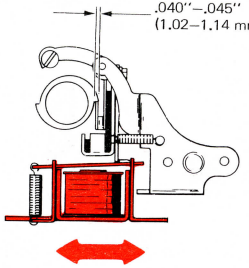
57 Cycle Clutch Armature Upstop (24-242)



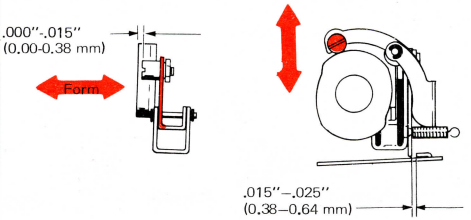
58 Cycle Clutch Armature Latch (24-224)



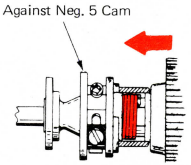
59 Cycle Clutch Latch Bite (24–237)



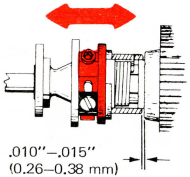
60 Cycle Clutch Restoring Roller (24–217)



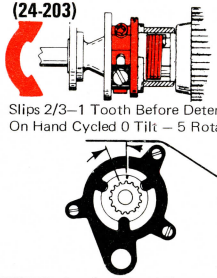
61 Cycle Clutch Spring Lateral (24-207)



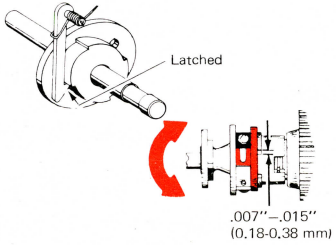
62 Cycle Clutch Sleeve End Play (24-208)



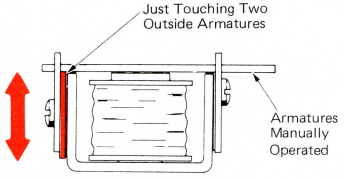
63 Cycle Clutch Spring Rotational (24-203)



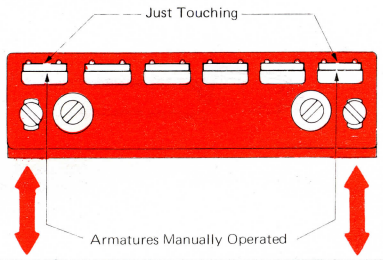
64 Cycle Clutch Overthrow Stop (24-206)



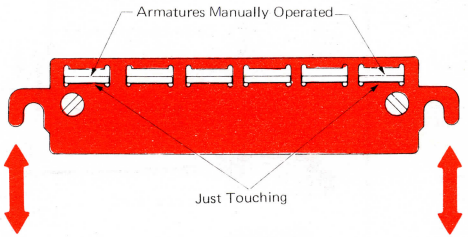
65 Selection Magnets Pivot Plate (24-319)



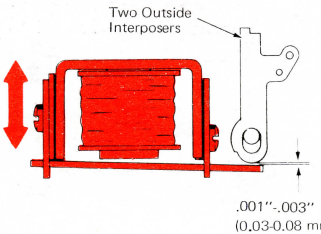
66 Selection Magnets Retainer Plate (24-322)



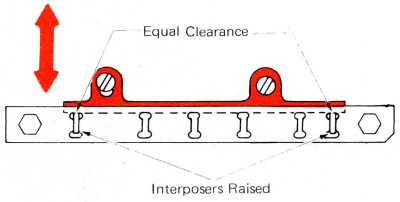
67 Armature Upstop (24-316)



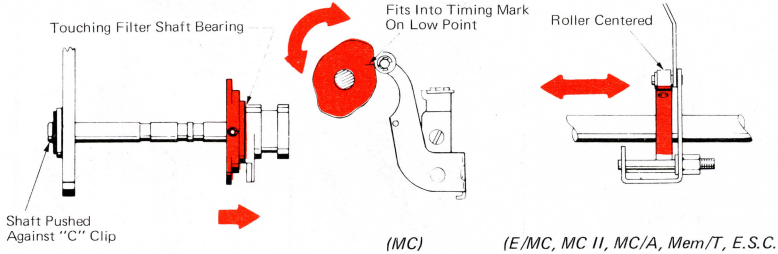
68 Selection Magnet Assembly (24-318)



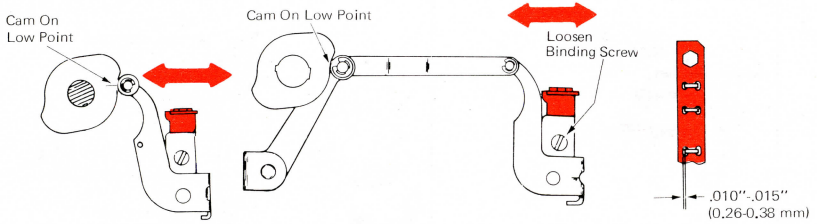
69 Selection Interposer Stop Bracket (24-304)



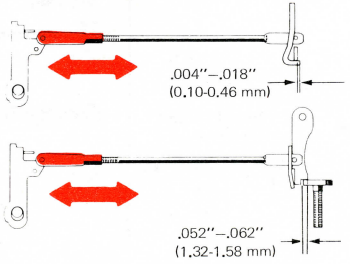
70 Selection Cam (24-244) (24-405)



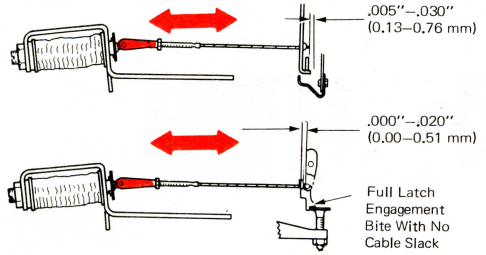
71 Selection Interposer Bail (24-301)



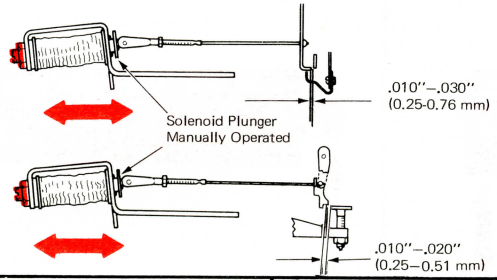
72 Selection Latch Links (24-305)



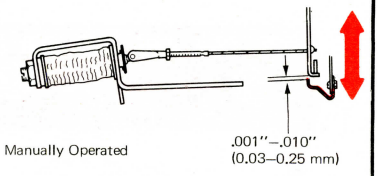
73 Selection Latch Cables (24-353)



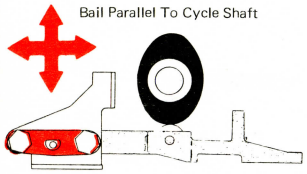
74 Selection Latch Motion (24-362)



Latch Lock-In Plate (24-139)

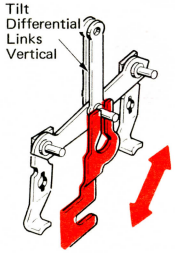


75 Latch Bail Shaft (24-227)

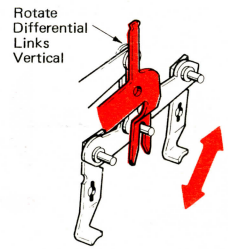


Note: Rollers should not clear the cycle shaft cams by more than .002" (0.05 mm)

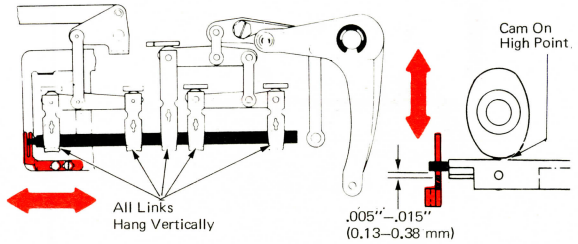
76 Tilt Differential Guide (24-110)



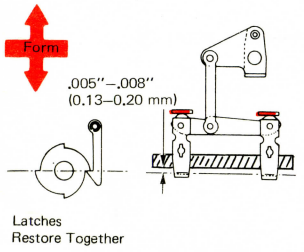
77 Rotate Differential Guide (24-109)



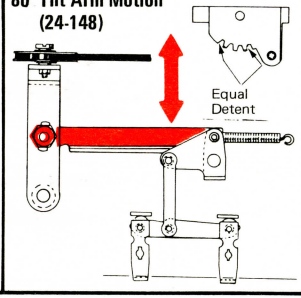
78 Latch Bail Guide (24-146)



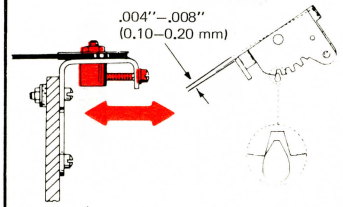
79 Tilt Latches (24-147)



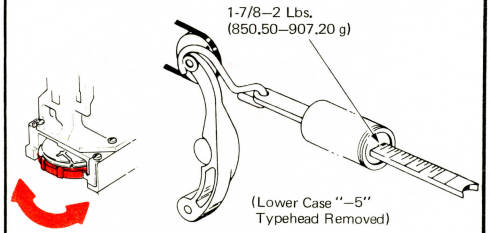
80 Tilt Arm Motion (24-148)



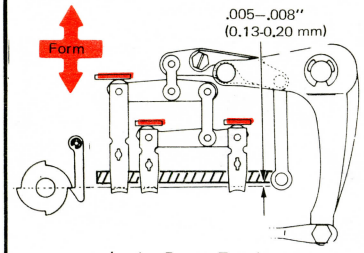
81 Tilt Ring Homing (24-19)



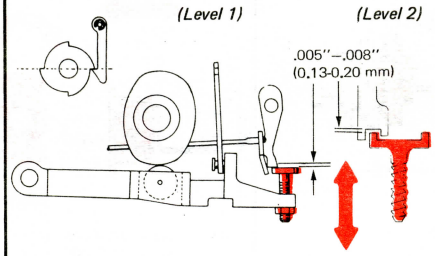
82 Rotate Spring (02-43)



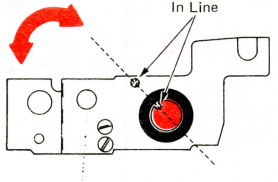
83 Rotate Latches (24-147)



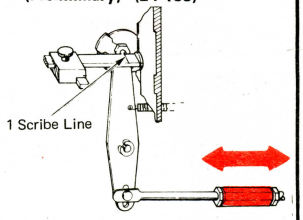
84 Five-Unit Latch (24-120)



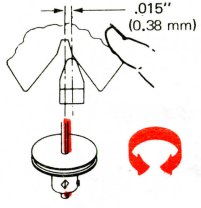
85 Print Shaft Timing (Preliminary) (03-20)



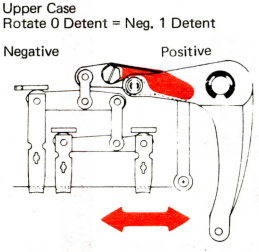
86 Rotate Arm Vertical (Preliminary) (24-133)



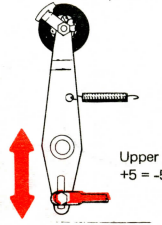
87 Coarse Homing (02-11)



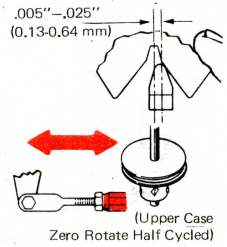
88 Balance Lever (24-143)



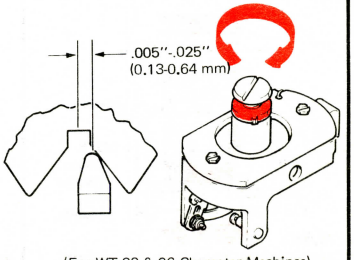
89 Rotate Arm Motion (24–161)



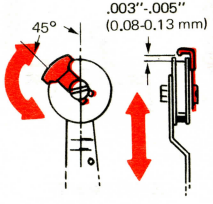
90 Typehead Fine Homing (24-133)



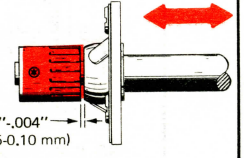
Typehead Homing (02–11)



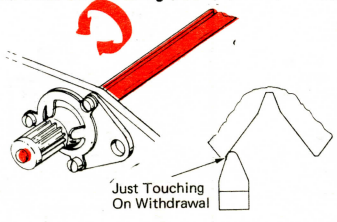
91 Rotate Pulley Guard (24-2)



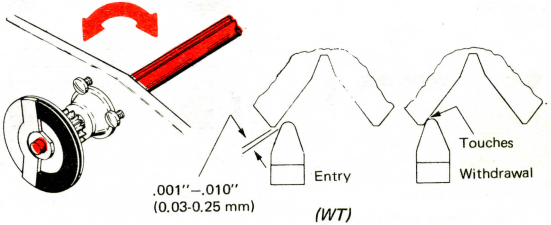
92 Print Shaft End Play (03-20)



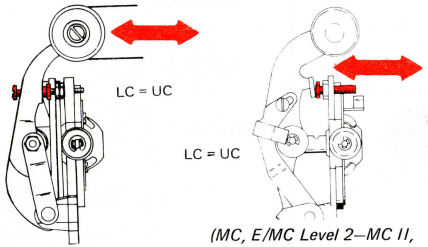
93 Print Shaft Timing (Final) (03-20)



Print Shaft Timing (Final) (03–125)



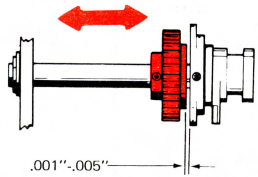
94 Shift Motion (16-58) (16-81)



(MC, E/MC Level 1)

(MC, E/MC Level 2—MC II, MC/A, Mem/T, E.S.C., MCC)

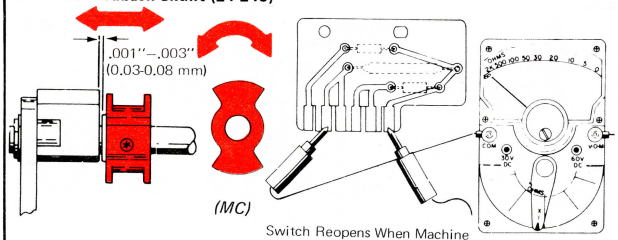
95 Print Feedback Gear (24—245)



(MC)

133

96 Print Feedback Shunt (24-249)

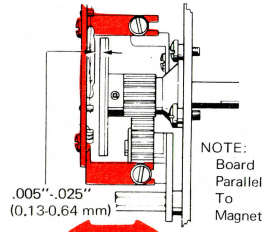


(MC)

NOTE: Switch Should Close Between 17°—37°

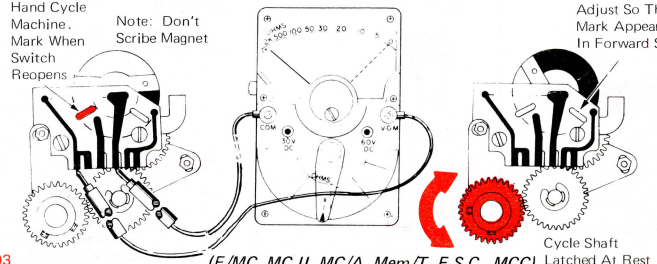
Switch Reopens When Machine Is Cycled To 122°—130°.

97 Print Feedback Bracket (24-420)



(E/MC, MC II, MC/A, Mem/T, E.S.C., MCC)

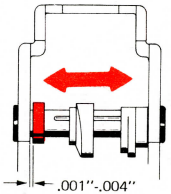
98 Print Feedback Switch (24-263)



93

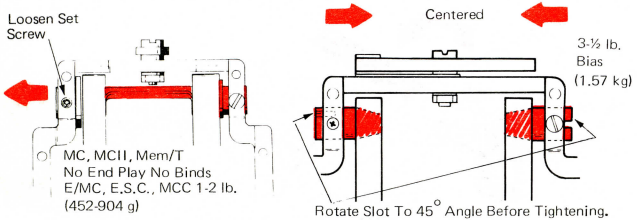
(E/MC, MC II, MC/A, Mem/T, E.S.C., MCC)

99 Print Sleeve End Play (03-218)



366

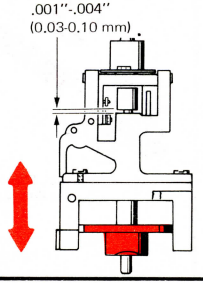
100 Rocker End Play (02-35) (02-81)



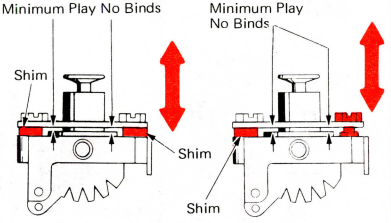
(MC, E/MC, MC II, MC/A Mem/T Level 2—E.S.C., MCC)

(E.S.C., Level 1)

101 Rotate Shaft End Play (02-40)



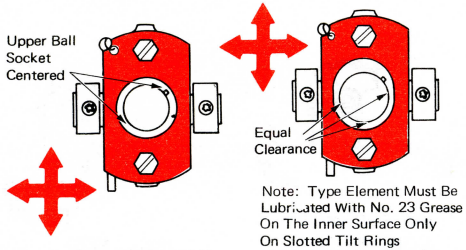
102 Upper Ball Socket (02-5) (02-69)



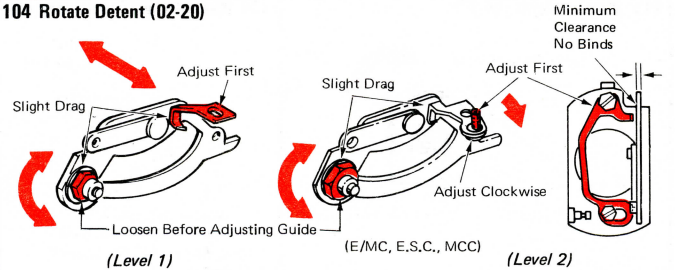
(MC, E/MC Level 1 — MC II, MC/A, Mem/T)

(E/MC Level 2— E.S.C., MCC)

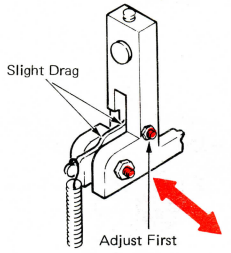
103 Tilt Ring Spacer (02-2) (02-76)



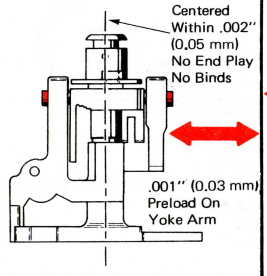
104 Rotate Detent (02-20)



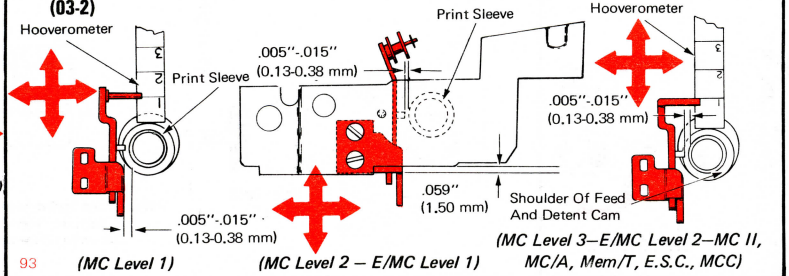
105 Tilt Detent (02-54)



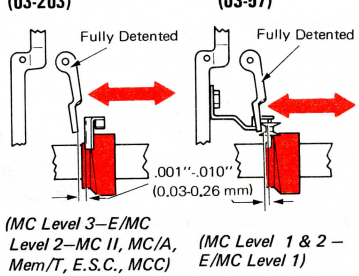
106 Tilt Ring (02-17)



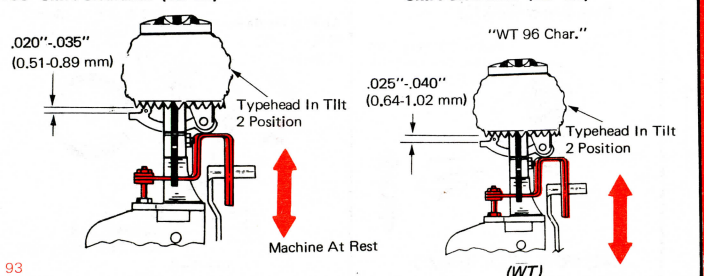
107 Detent Cam Follower Bracket (03-2) (03-2)



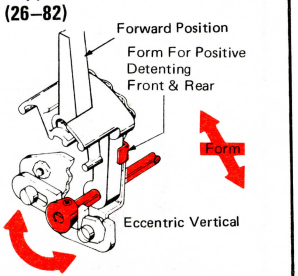
108 Detent Cam (03-203) (03-57)



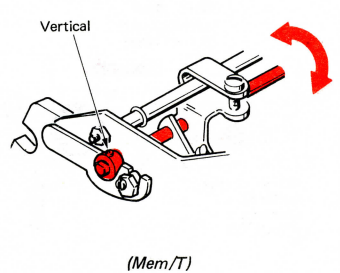
109 Skirt Clearance (02-21)



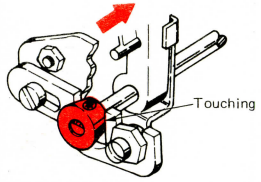
110 Copy Control Lever Shaft (26–82)



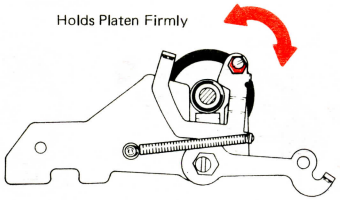
111 Copy Control Shaft Clamp (26–82)



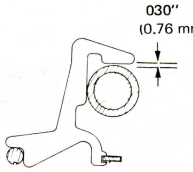
112 Copy Control Eccentric (26-82)



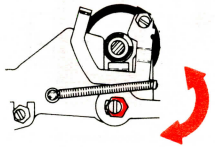
113 Platen Latches (26-83)



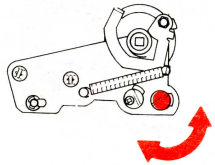
114 Platen Height Preliminary (26-89)



(MC, MC II, MC/A, Mem/T, E/MC, E.S.C., MCC)

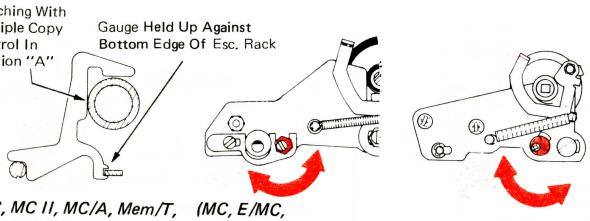


(MC, E/MC, MC II, MC/A, Mem/T)



(E.S.C., MCC)

115 Platen Front-To-Rear (26-87)



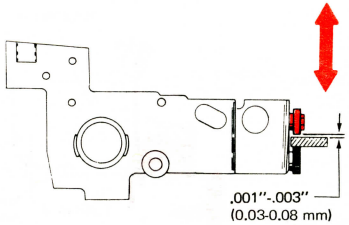
(MC, MC II, MC/A, Mem/T, E/MC, E.S.C., MCC)

114, 275, 290, 390, 392, 402

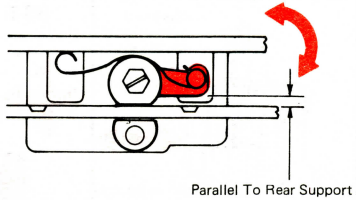
(MC, E/MC, MC II, MC/A, Mem/T)

(E.S.C., MCC)

116 Rear Carrier Shoe (03-9)

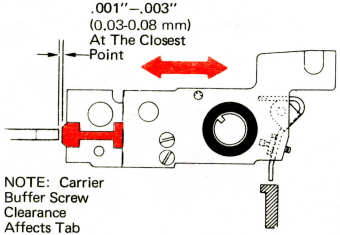


Rear Carrier Shoe Tension (03-118)



Note: Reset Spring Tension After Loosening Rear Carrier Mounting Shoe Screw.

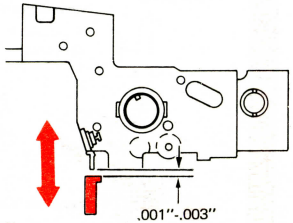
117 Carrier Buffer Screws (03-75)



NOTE: Carrier Buffer Screw Clearance Affects Tab

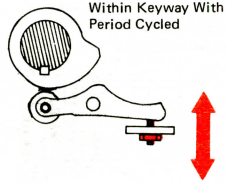
(MC)

118 Front Carrier Support (03-22)



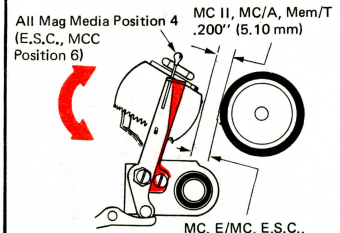
Note: Check With Carrier At Both Ends

119 Print Cam Follower Stop Screw (03-212)



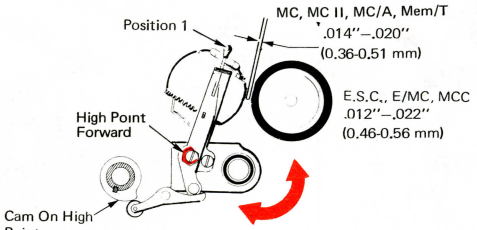
(MC, MC II, MC/A, Mem/T)

120 Powered Travel (02-34)



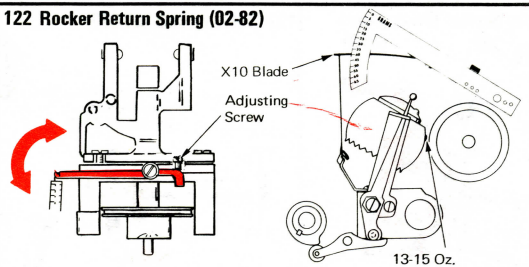
(At Rest)

121 Free Flight (02-39)

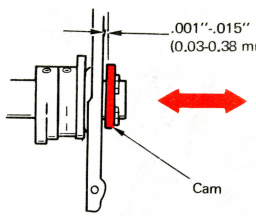


120

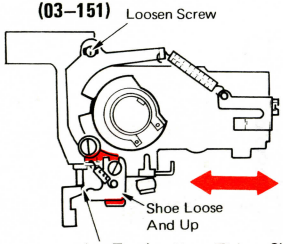
122 Rocker Return Spring (02-82)



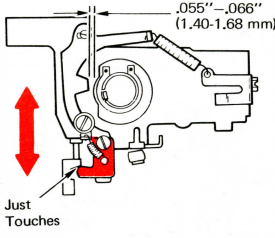
123 Carrier Clamp Cam (03-142)



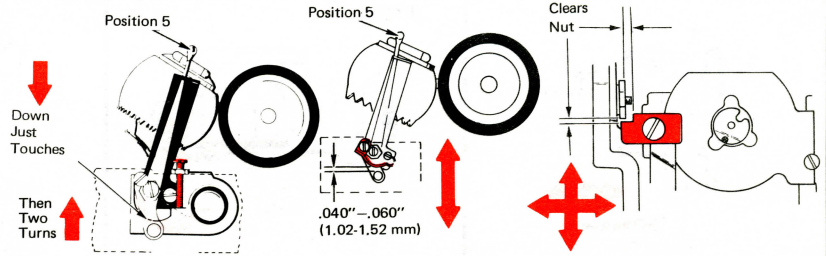
124 Carrier Clamp Cam Follower (03–151)



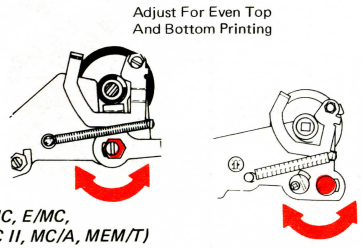
125 Carrier Clamp Shoe (03-147)



126 Rocker Upstop (03-46) (03-116) (02-45)

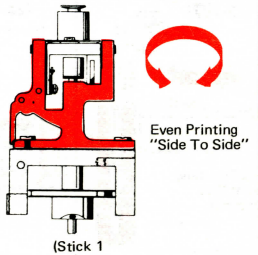


127 Platen Height Final (26-89)



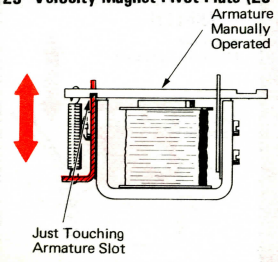
270, 290, 390

128 Yoke Position (02-16)

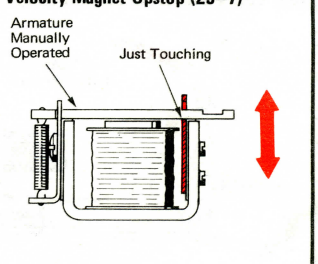


90

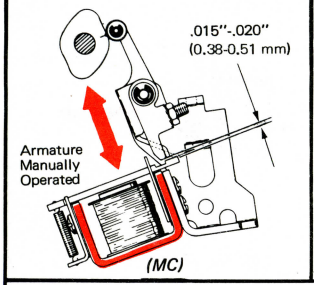
129 Velocity Magnet Pivot Plate (25–3)



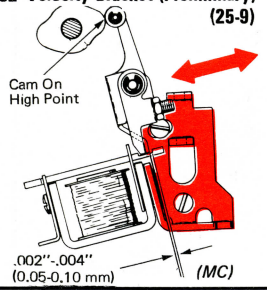
130 Velocity Magnet Upstop (25–7)



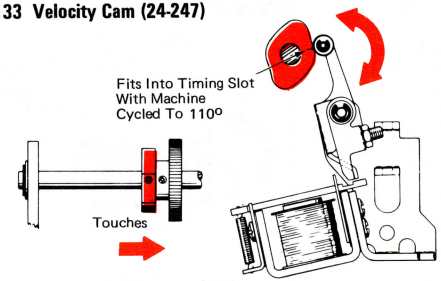
131 Velocity Magnet Assembly (25-5)



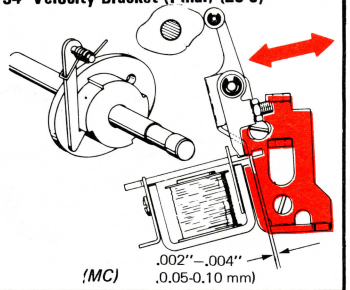
132 Velocity Bracket (Preliminary) (25-9)



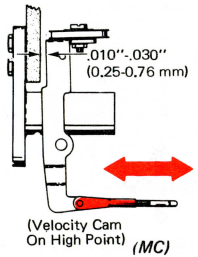
133 Velocity Cam (24-247)



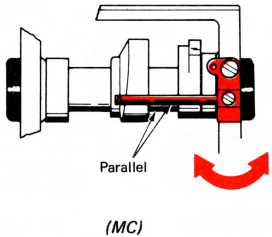
134 Velocity Bracket (Final) (25-9)



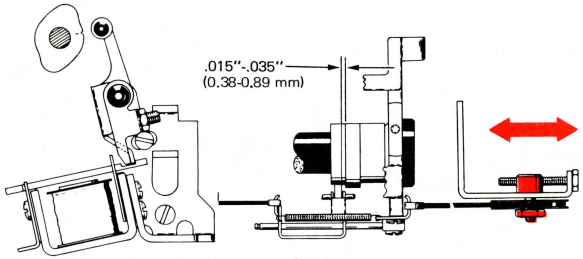
135 Velocity Tape Arm (25-29)



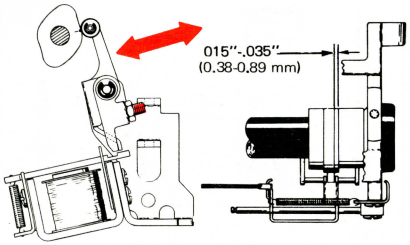
136 Tab Cord Anchor Bracket (03-28)



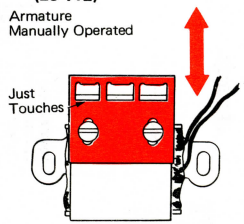
137 Velocity Idler Pulley (25-14)



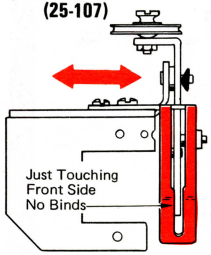
138 Low Velocity Bail Screw (25-24)



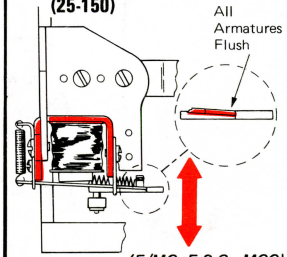
139 Velocity Armature Upstop (25-112)



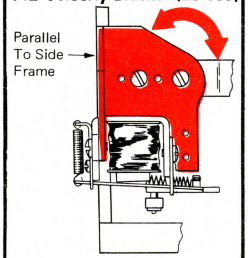
140 Velocity Arm Guide (25-107)



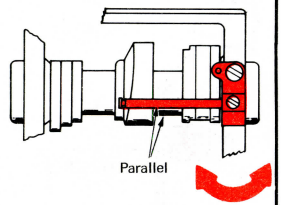
141 Velocity Magnet Assembly (25-150)



142 Velocity Bracket (25-109)

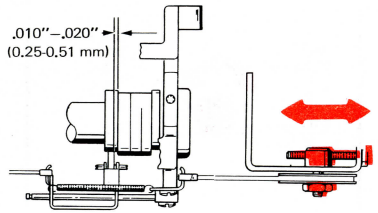


143 Tab Cord Anchor Bracket (03-128)



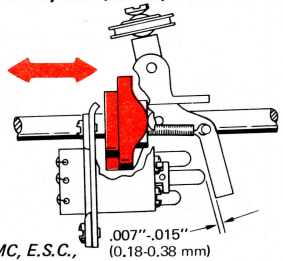
(E/MC, E.S.C., MCC)

144 RH Velocity Tape Pulley (25-14)



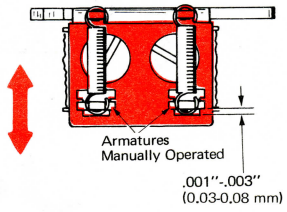
(No Print Cycled) *(E/MC, E.S.C., MCC)*

145 Velocity Cam (25-125)



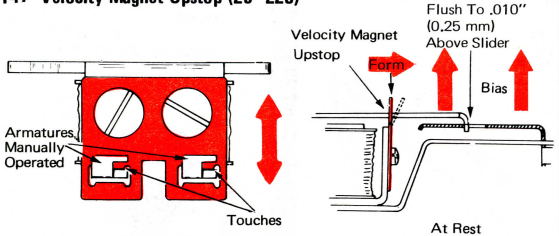
(E/MC, E.S.C., MCC) (Cycle Shaft Latched At Home)

146 Velocity Magnet Pivot Plate (25–203)



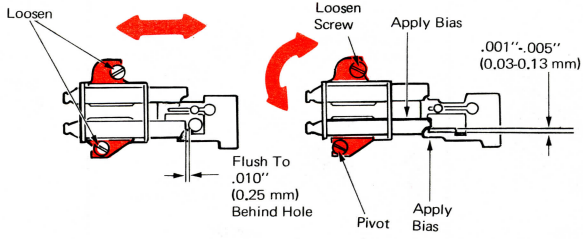
(MC II, MC/A, Mem/T)

147 Velocity Magnet Upstop (25–223)



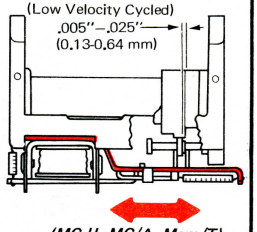
(MC II, MC/A, Mem/T)

148 Magnet Pack (25–205)



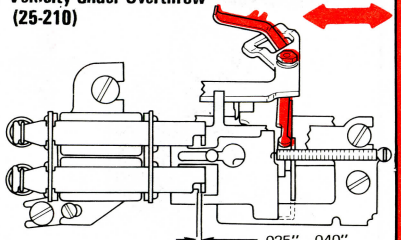
(MC II, MC/A, Mem/T)

149 Velocity Magnet Assembly (25-205)



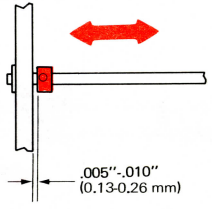
(MC II, MC/A, Mem/T)

150 Velocity Slider Overthrow (25-210)



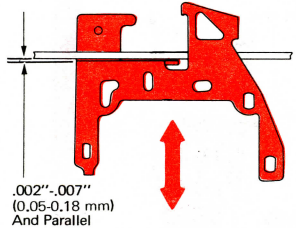
(MC II, MC/A, Mem/T)

151 Escapement Torque Bar End Play (07-28)



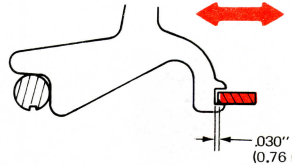
(MC)

152 Tab Escapement Bracket (07-2)



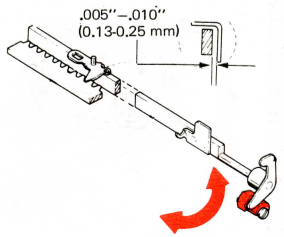
211, 212, 213 *(MC)*

153 Escapement Rack (07-33)



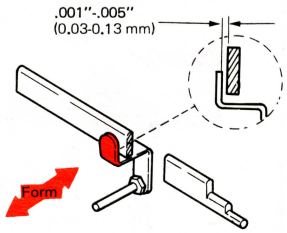
211, 212, 213 *(MC)*

154 Torque Bar Eccentric (07-17)



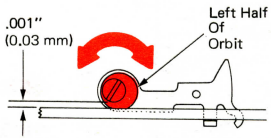
212, 249 *(MC)*

155 Torque Bar Backstop (05-62)



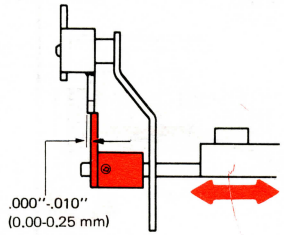
(MC)

156 Pawl Mounting Stud (07-7)



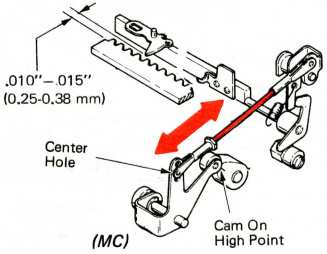
(MC)

157 Escapement Arm (07-14)



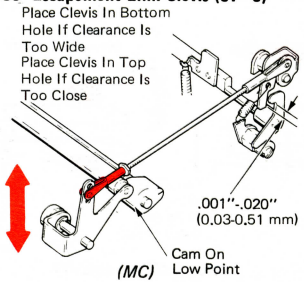
(MC)

158 Escapement Link (Preliminary) (07-9)



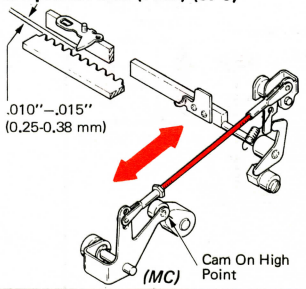
(MC)

159 Escapement Link Clevis (07–8)



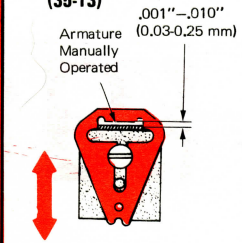
(MC)

160 Escapement Link (Final) (07-9)



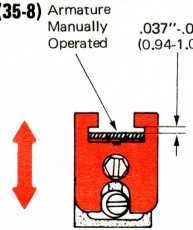
159 *(MC)*

161 Dead Key Pivot Plate (35-13)



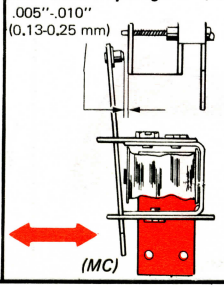
(MC)

162 Dead Key Upstop (35-8)



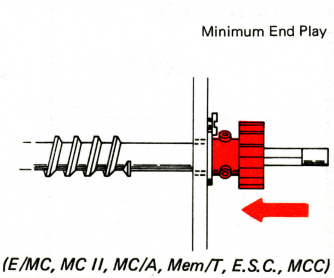
(MC)

163 Dead Key Magnet (35-12)



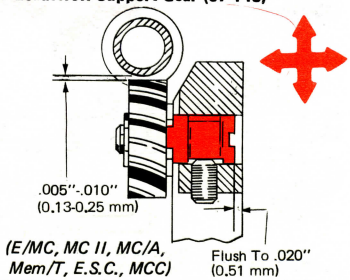
(MC)

164 Leadscrew Ratchet (07-119)



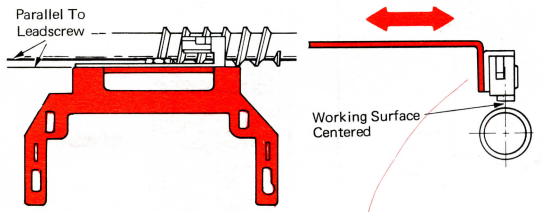
(E/MC, MC II, MC/A, Mem/T, E.S.C., MCC)

165 Leadscrew Support Gear (07-143)



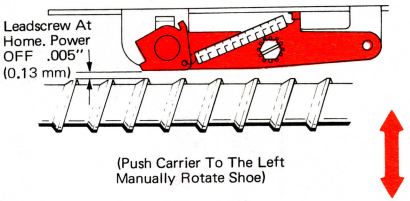
(E/MC, MC II, MC/A, Mem/T, E.S.C., MCC)

166 Escapement Bracket (07-135)



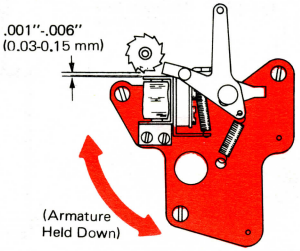
(E/MC, MC II, MC/A, Mem/T, E.S.C., MCC)

167 Leadscrew Shoe (07-136)



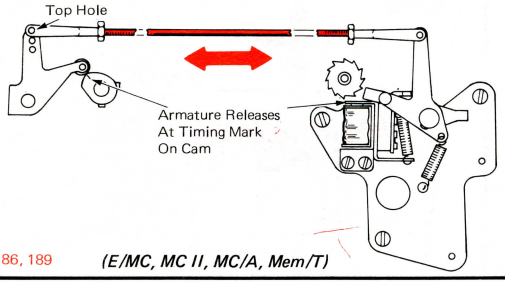
(E/MC, MC II, MC/A, Mem/T, E.S.C., MCC)

168 Escapement Magnet Plate (07-113)



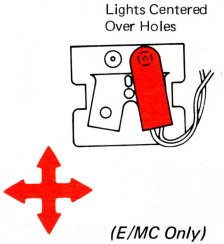
(E/MC, MC II, MC/A, Mem/T)

169 Escapement Link (07–132)



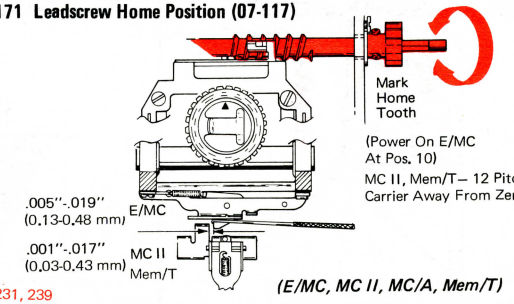
186, 189 *(E/MC, MC II, MC/A, Mem/T)*

170 Emitter Lamps (07-107)



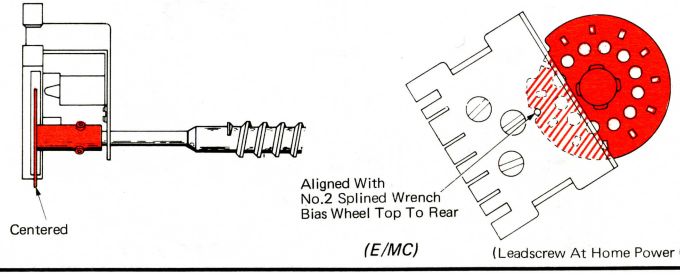
(E/MC Only)

171 Leadscrew Home Position (07-117)



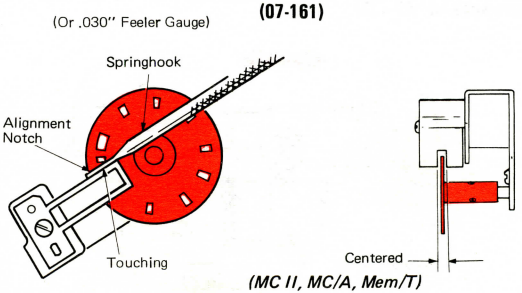
231, 239 *(E/MC, MC II, MC/A, Mem/T)*

172 Emitter Wheel (07-105)



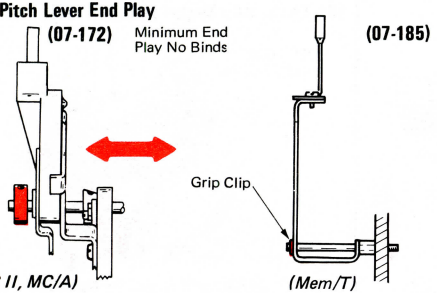
(E/MC) (Leadscrew At Home Power On)

(07-161)

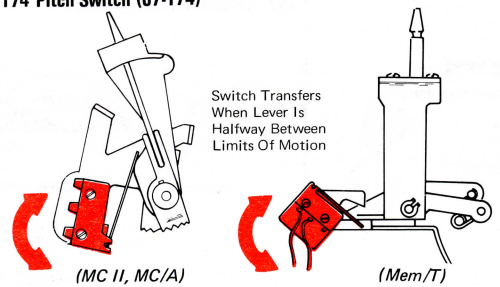


(MC II, MC/A, Mem/T)

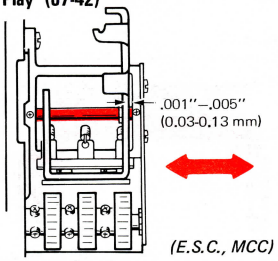
173 Pitch Lever End Play



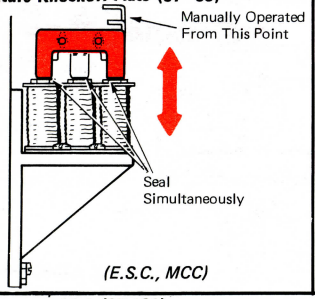
174 Pitch Switch (07-174)



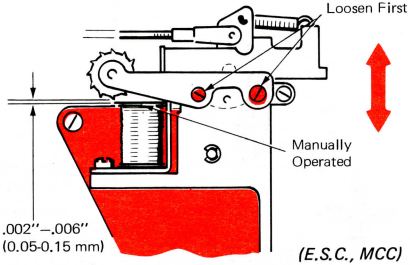
175 Armature Knockoff Bracket End Play (07-42)



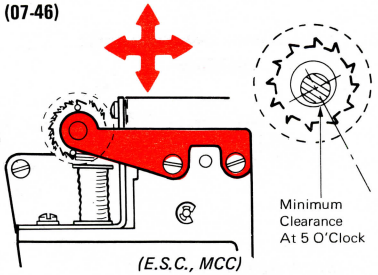
176 Armature Knockoff Plate (07–59)



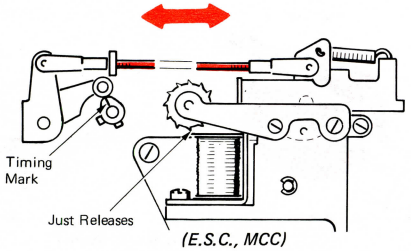
177 Escapement Magnet Bracket (07-48)



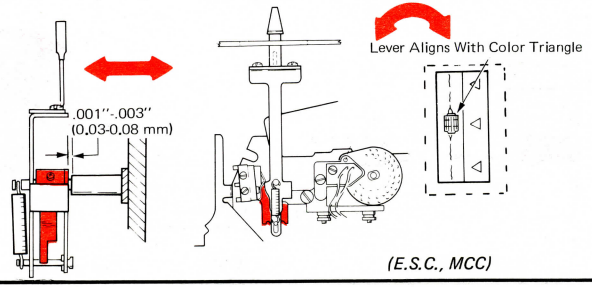
178 Leadscrew Outboard Support Bracket (07-46)



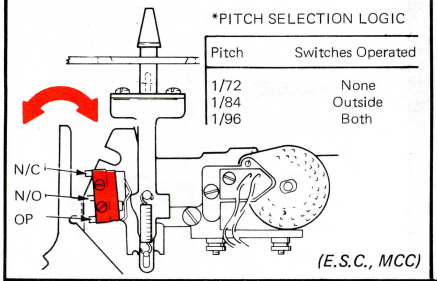
179 Escapement Link (07-132)



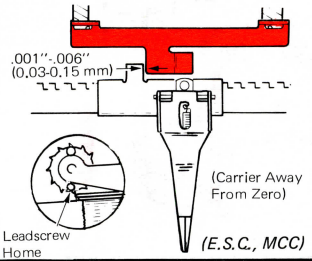
180 Pitch Selector Lever (07-73)



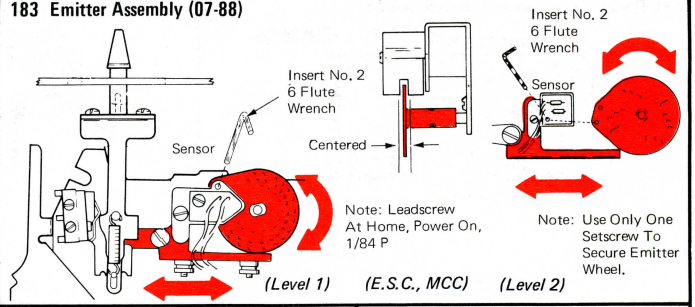
181 Pitch Selector Switches (07-71)



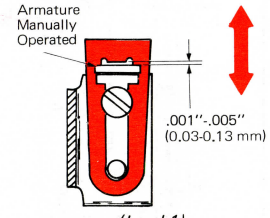
182 Margin Stop Bracket (Leadscrew Home Position) (09-06)



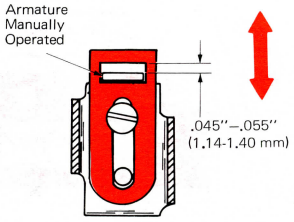
183 Emitter Assembly (07-88)



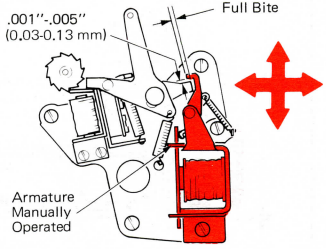
184 Dead Key Pivot Plate (35-52)



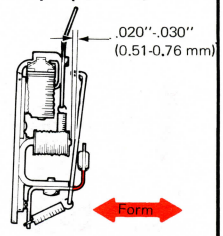
185 Dead Key Upstop (35-59)



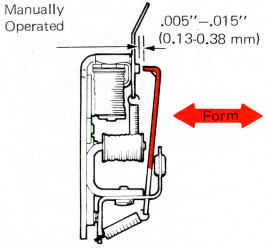
186 Dead Key Magnet (35-75)



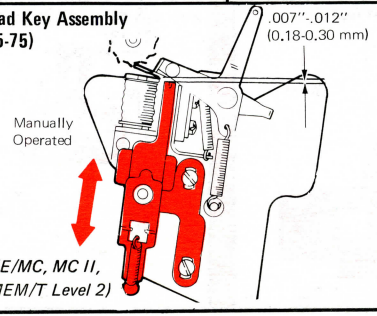
187 Dead Key Magnet — Armature Upstop (35–75)



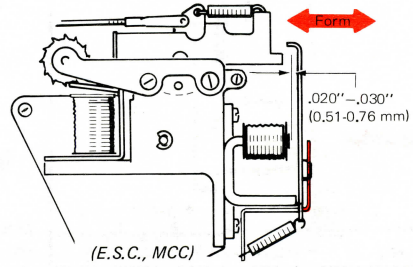
188 Dead Key Magnet — Armature (35-75)



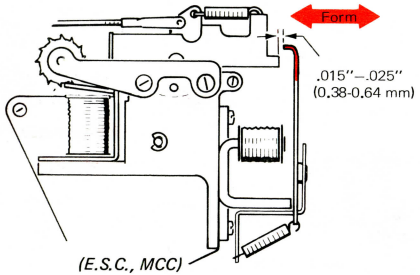
189 Dead Key Assembly (35-75)



190 Dead Key Magnet — Armature Upstop (35-75)

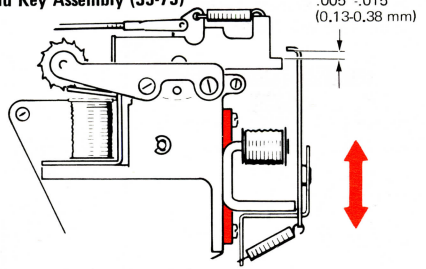


191 Dead Key Magnet — Armature (35-75)



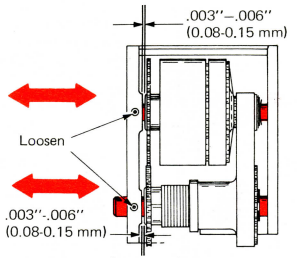
(E.S.C., MCC)

192 Dead Key Assembly (35-75)



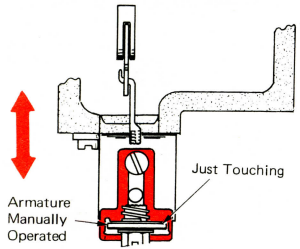
(E.S.C., MCC)

193 Clutch End Play (06-50)



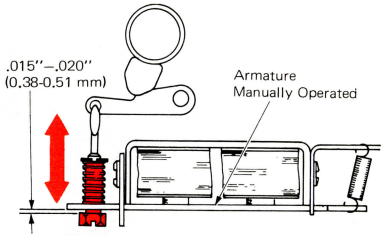
(E/MC, MC II, MC/A, Mem/T, E.S.C., MCC)

194 B/S Armature Upstop (06-22)



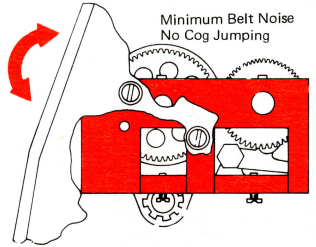
(E/MC, MC II, MC/A, Mem/T, E.S.C., MCC)

195 Backspace Link (06-23)



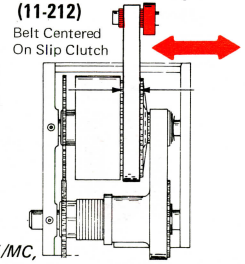
(E/MC, MC II, MC/A, Mem/T, E.S.C., MCC)

196 Slip Clutch Belt Tension (06-7)



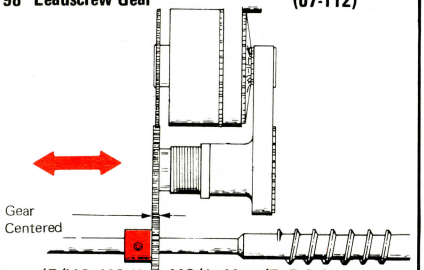
(E/MC, MC II, MC/A, Mem/T, E.S.C., MCC)

197 Leadscrew Drive Pulley (11-212)



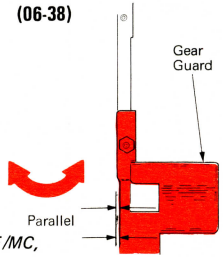
(E/MC, MC II, MC/A, Mem/T, E.S.C., MCC)

198 Leadscrew Gear (07-112)



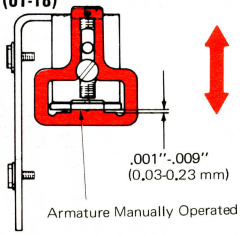
(E/MC, MC II, MC/A, Mem/T, E.S.C., MCC)

199 Leadscrew Gear Guard (06-38)



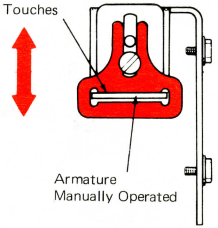
(E/MC, MC II, MC/A, Mem/T, E.S.C., MCC)

200 B/S Armature Pivot Plate (01-18)



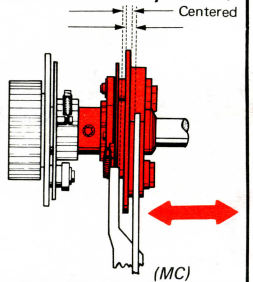
(MC)

201 B/S Armature Upstop (01-14)



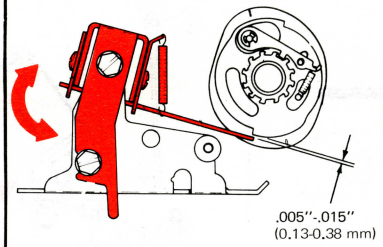
(MC)

202 B/S Cam Assembly (01–60)



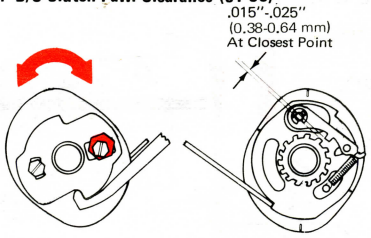
(MC)

203 B/S Cam Release Clearance (01-16)



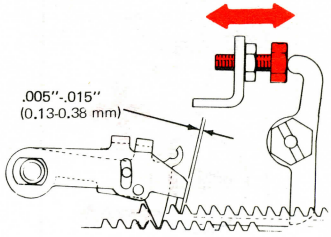
(MC)

204 B/S Clutch Pawl Clearance (01-35)



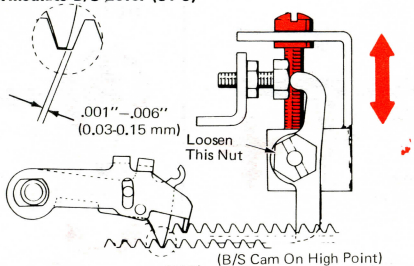
(MC)

205 B/S Rack Position (01-4)



(MC) (B/S Cam Low Point)

206 Intermediate B/S Lever (01-9)

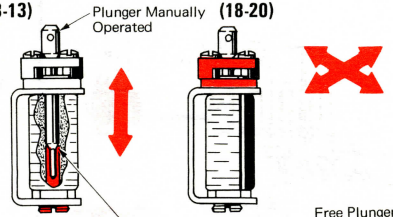


(B/S Cam On High Point)

205

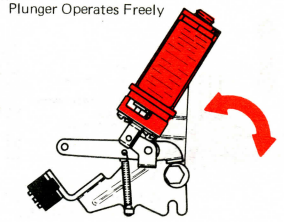
(MC)

207 Tab Solenoid (18-13) (18-20)



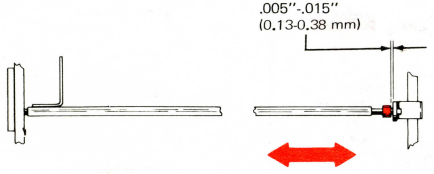
(MC)

208 Tab Solenoid Mounting (18-350)



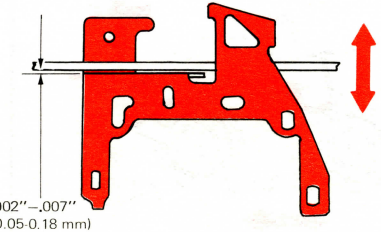
(MC)

209 Tab Torque Bar End Play (18-11)



(MC)

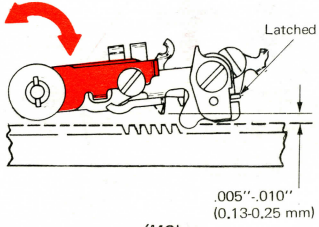
210 Tab Escapement Bracket (07-2)



154, 156, 158

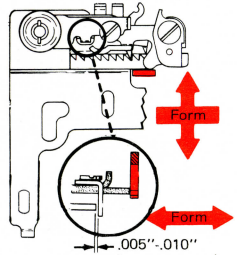
(MC)

211 Tab Pawl Clearance (18-65)



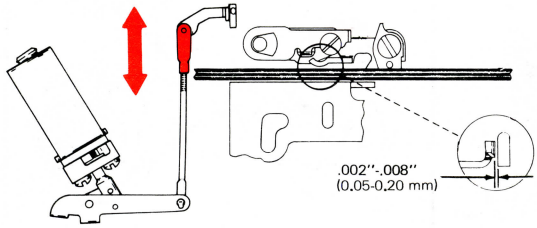
(MC)

212 Tab Lever Stop (07-2)



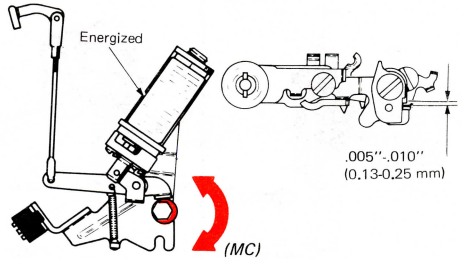
(MC)

213 Tab Link (18-34)



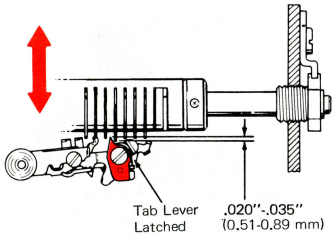
(MC)

214 Tab Solenoid Eccentric (18-23)



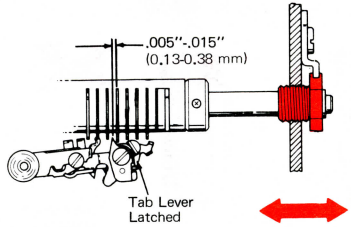
(MC)

215 Tab Lever Pawl (18-58)



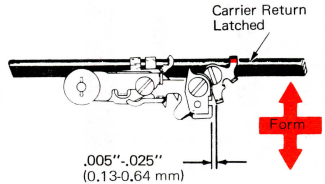
(MC)

216 Tab Rack Lateral (18-5)



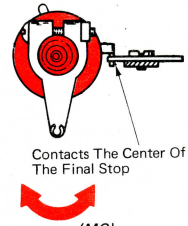
(MC)

217 Tab Lever Latch (18-61)



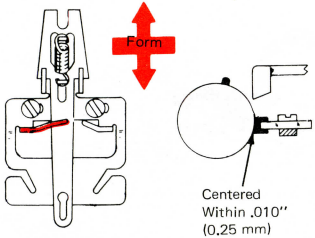
(MC)

218 Tab Rack Rotational (18-1)



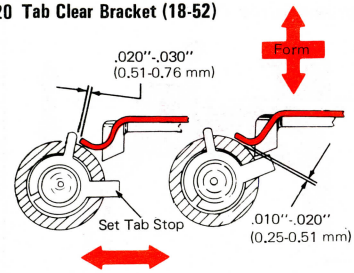
(MC)

219 Tab Set Lug (18-36)



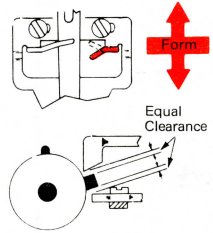
(MC)

220 Tab Clear Bracket (18-52)



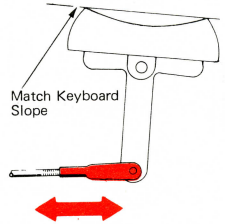
(MC)

221 Tab Clear Stop Lug (18-36)



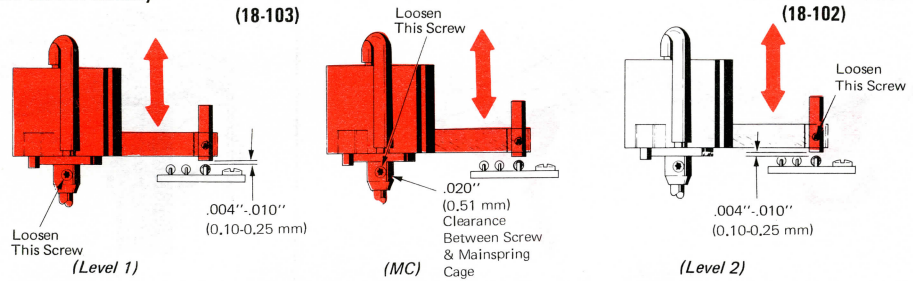
(MC)

222 Set And Clear Keybutton (18-30)

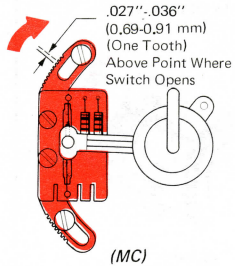


(MC)

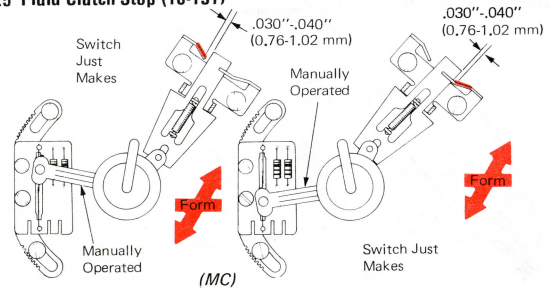
223 Fluid Clutch Assembly



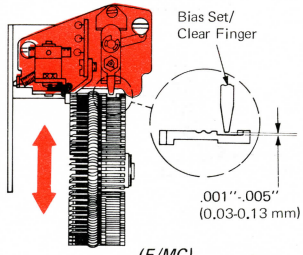
224 Long Function Switch (18-110)



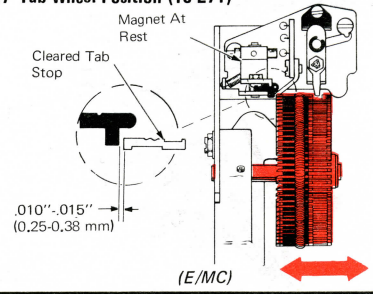
225 Fluid Clutch Stop (18-131)



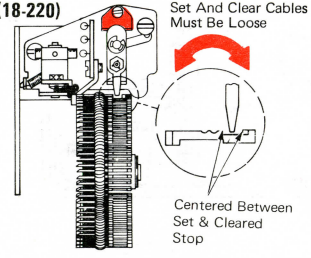
226 Tab Mounting Plate (18-264)



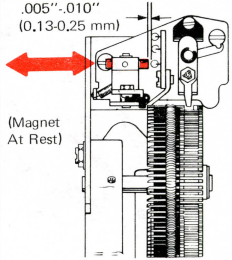
227 Tab Wheel Position (18-271)



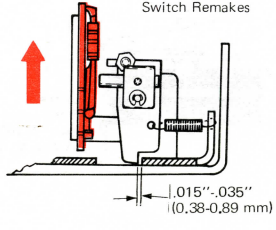
228 Set/Clear Finger Rest Position (18-220)



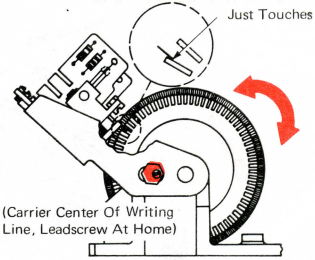
229 Magnet Position (18-221)



230 Tab Feedback Switch (18-209)

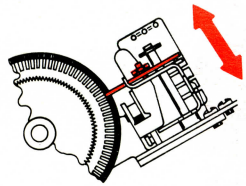


231 Tab Bracket Eccentric (18-223)



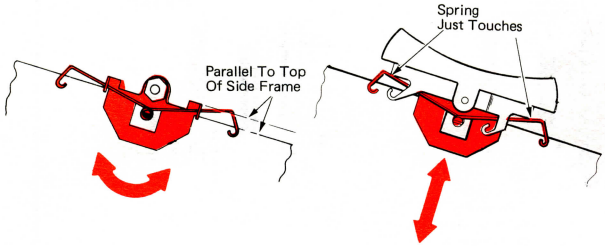
232 Set/Clear Finger Height (18-205)

1. Tab To Center Of Writing Line
2. Center Finger On The Stop



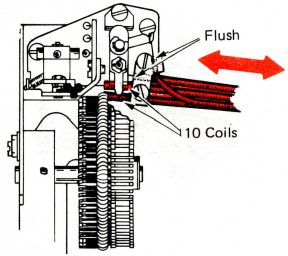
(E/MC)

233 Set/Clear Spring Plate (18-247)



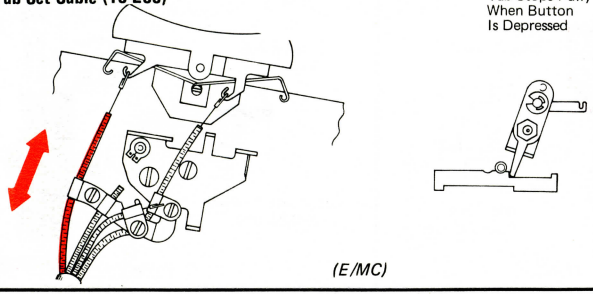
(E/MC)

234 Cable Sheaths Rear (18-266)



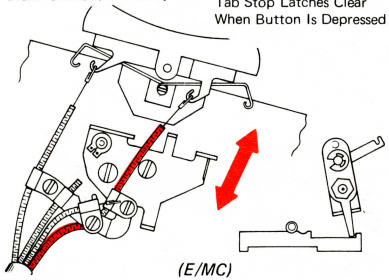
(E/MC)

235 Tab Set Cable (18-266)



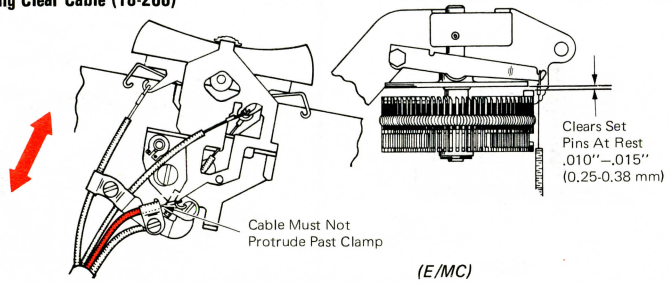
(E/MC)

236 Tab Clear Cable (18–266)



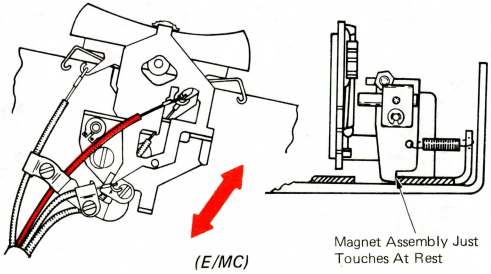
(E/MC)

237 Gang Clear Cable (18-266)



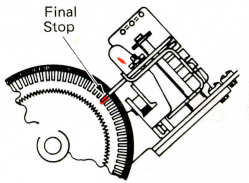
(E/MC)

238 Tab Locate Cable (18-266)



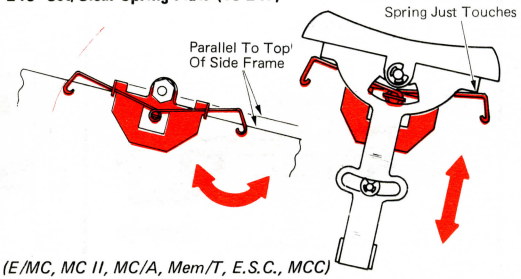
(E/MC)

239 Final Stop (18-276)



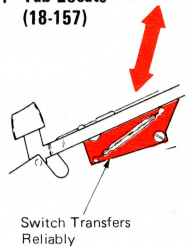
(E/MC)

240 Set/Clear Spring Plate (18-247)



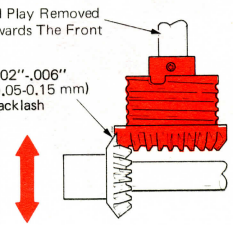
(E/MC, MC II, MC/A, Mem/T, E.S.C., MCC)

241 Tab Locate (18-157)

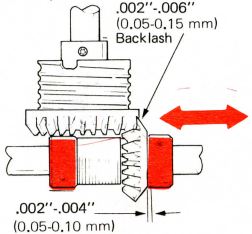


(E.S.C., MCC)

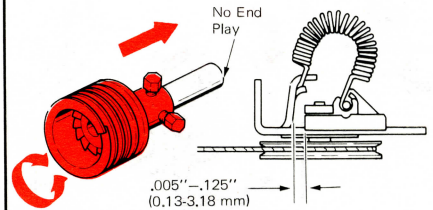
242 Tab Cord Drum (18-126)



243 Tab Governor Pinion (18-137)

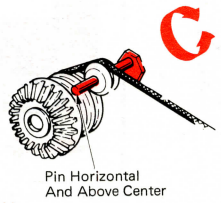


244 Cord Tension (05-106)



242, 243

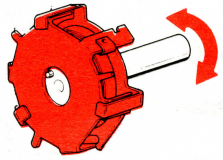
245 Idler Pulley Eccentric (18-113)



244

246 Mainspring (18-105)

(E/MC, E.S.C., MCC, 5-2/3—6-1/3 Turns)

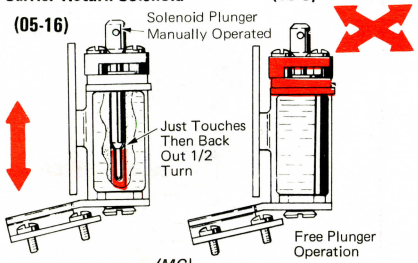


(MC, MC II, MC/A, MEM/T)

4 2/3 — 5 1/3 Turns

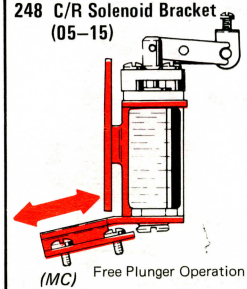
(Carrier At Right Limit)

247 Carrier Return Solenoid (05-5) (05-16)



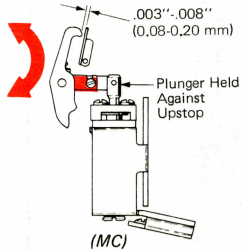
(MC)

248 C/R Solenoid Bracket (05—15)



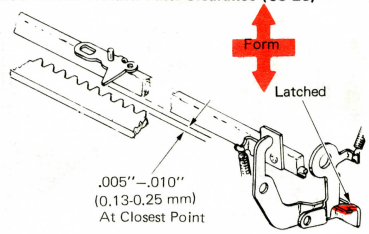
(MC) Free Plunger Operation

249 Pivot Pin Actuating Arm (05—8)



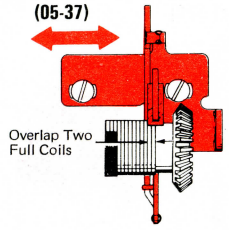
(MC)

250 Carrier Return Pawl Clearance (05-25)



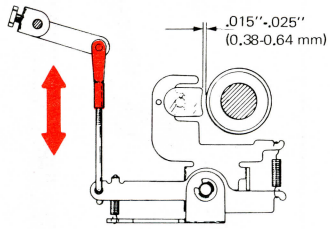
217 *(MC)*

251 C/R Shoe Bracket (05-37)



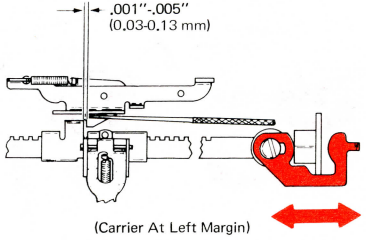
(MC)

252 C/R Shoe Clearance (05-66)



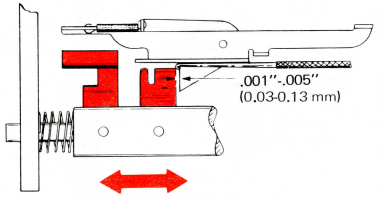
(MC)

253 Margin Rack Position (09-8)



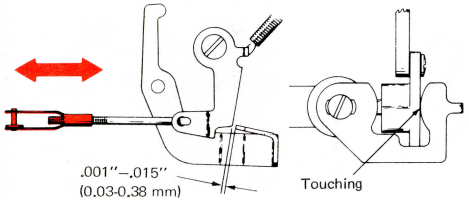
(MC)

254 Margin Rack Final Stop (09-33)



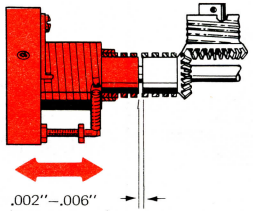
(MC) (Carrier At Left Limit)

255 Clutch Unlatching Link (05-33)



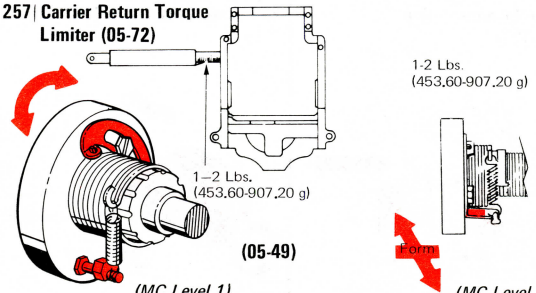
(MC)

256 Torque Limiter Arbor End Play (05-53)



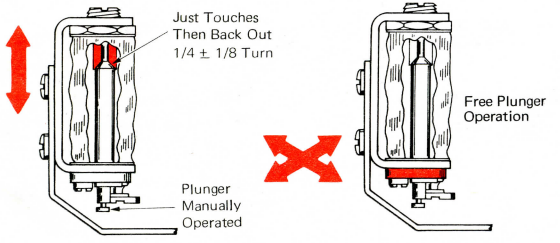
(MC)

257 Carrier Return Torque Limiter (05-72)



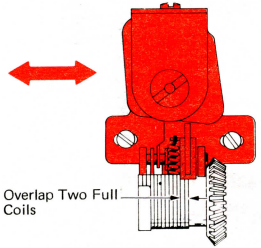
(MC Level 1) *(MC Level 2)*

258 C/R Solenoid (05-16) (05-14)



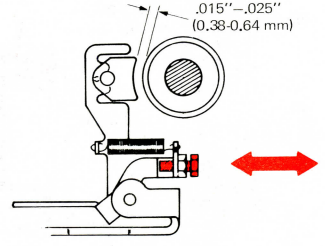
(E/MC, MC II, MC/A, Mem/T, E.S.C., MCC)

259 C/R Solenoid Assembly (05-112)



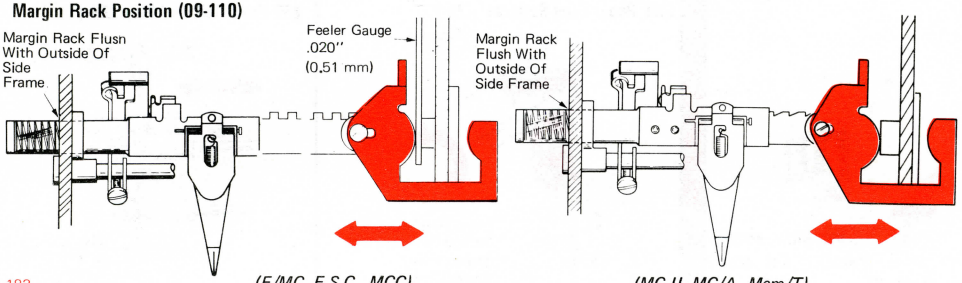
(E/MC, MC II, MC/A, Mem/T, E.S.C., MCC)

260 C/R Shoe Clearance (05-119)



(E/MC, MC II, MC/A, Mem/T, E.S.C., MCC)

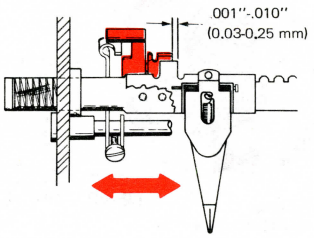
261 Margin Rack Position (09-110)



171, 182

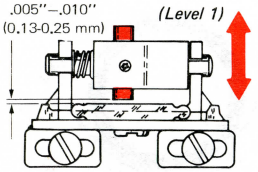
(E/MC, E.S.C., MCC) *(MC II, MC/A, Mem/T)*

262 Margin Rack Final Stop (09-33)



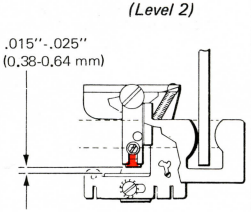
(E/MC, MC II, MC/A, Mem/T, E.S.C., MCC)

263 Overbank Switch Magnet (09-116)



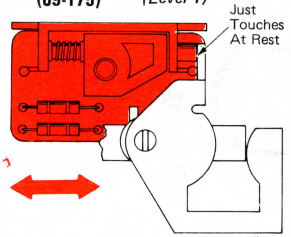
(E/MC, MC II, MC/A, Mem/T, E.S.C., MCC)

Overbank Switch Magnet (09-175)

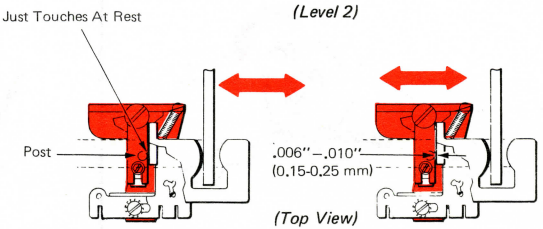


(Top View)

264 Overbank Switch Assembly (09-175) (Level 1)

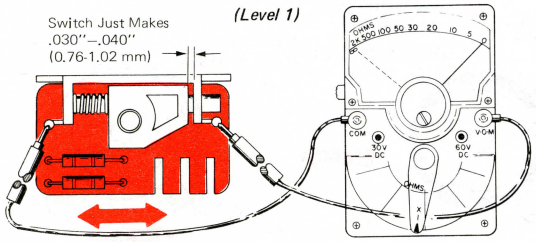


(E/MC, MC II, MC/A, Mem/T, E.S.C., MCC)

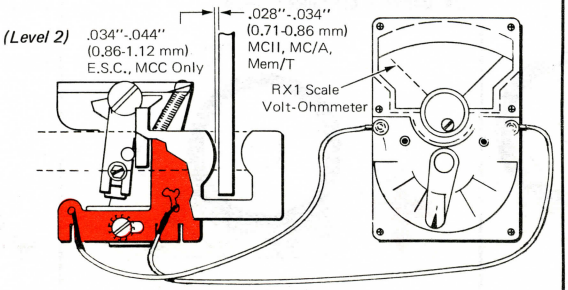


MCII, MC/A, Mem/T *(E.S.C., MCC)*

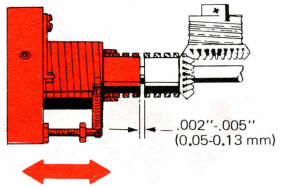
265 Overbank Switchboard (09-121)



(E/MC, MC II, MC/A, Mem/T, E.S.C.,)

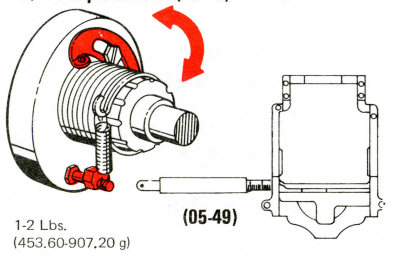


266 Torque Limiter Arbor End Play (05-53)

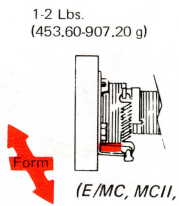


(E/MC, MC II, Mem/T, E.S.C., MCC)

267 C/R Torque Limiter (05-72)

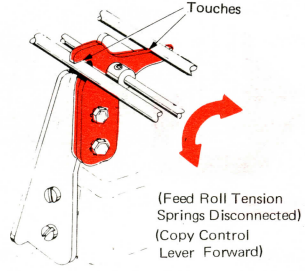


(Level 1) *(E/MC, MC II, MC/A, Mem/T, E.S.C., MCC)*

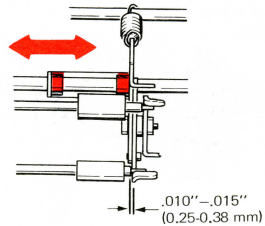


(E/MC, MCII, MC/A, Mem/T, E.S.C., MCC) *(Level 2)*

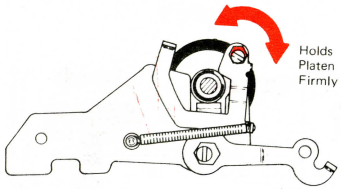
268 Paper Feed Support (26-27)



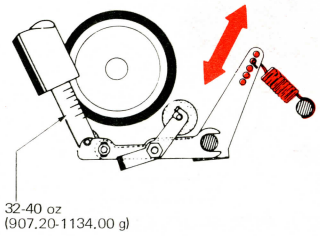
269 Feed Roll End Play (26-4)



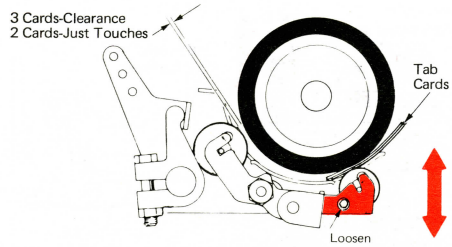
270 Platen Latches (26-83)



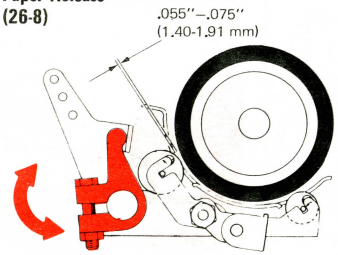
271 Feed Roll Tension (26–3)



272 Feed Roll Adjustment (26-35)

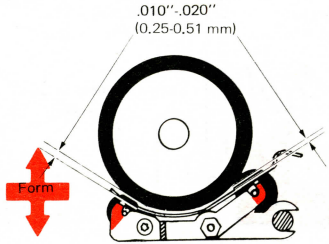


273 Paper Release (26-8)

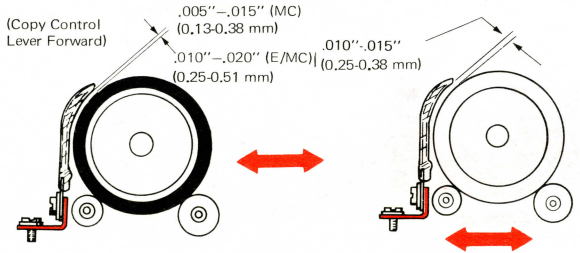


(Feed Rolls Released)

274 Deflector Clearance (26–36)

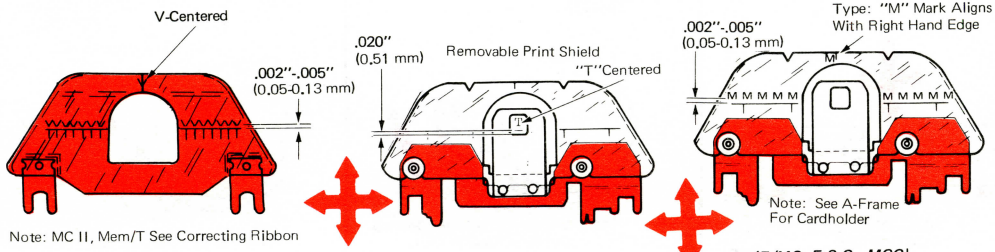


275 Cardholder Brackets (26-120)



(MC, EM/C) "WT 96 Char."

276 Cardholder (26-122) (26-161) (26-151)

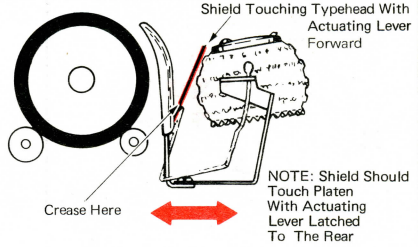


Note: MC II, Mem/T See Correcting Ribbon

275

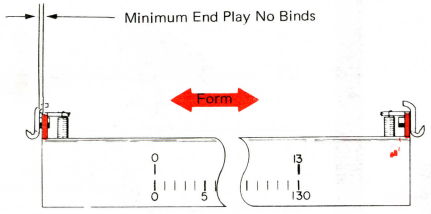
(MC) *(E/MC, E.S.C., MCC)*

277 Print Shield Front-To-Rear (26-151)



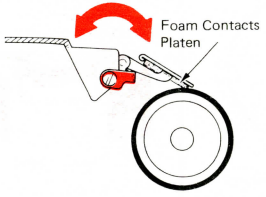
(MC, E/MC)

278 Paper Table Arm (30-38)



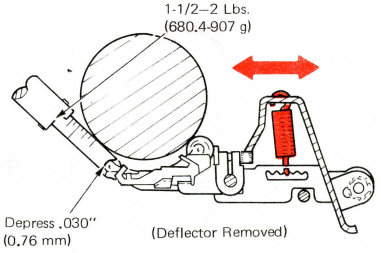
(MC)

279 Paper Table Mounting Bracket (30-12)



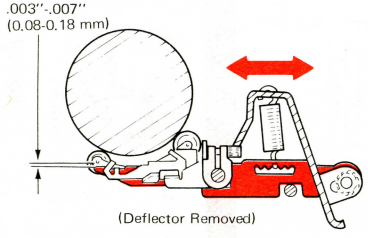
(MC)

280 Feed Roll Tension (26–338)



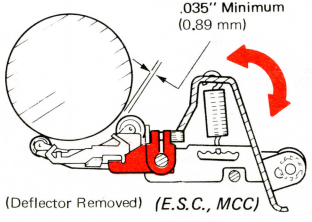
(E.S.C., MCC)

281 Feed Roll Arm Asm. (26-349)



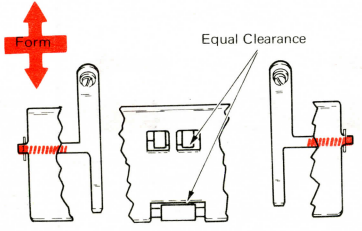
(E.S.C., MCC)

282 Feed Roll Release Arm (26-359)



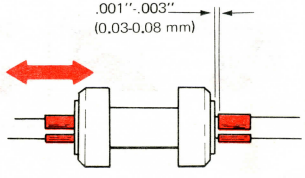
(E.S.C., MCC)

283 Deflector Mounting Arm (26-330)



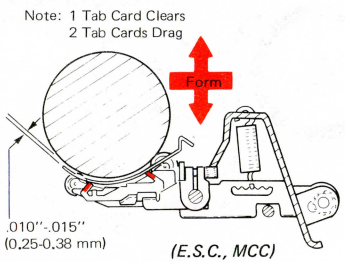
(E.S.C., MCC)

284 Feed Rolls (26-346)



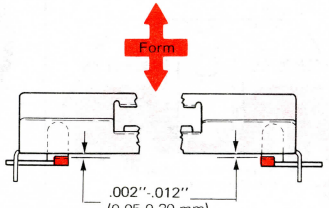
(E.S.C., MCC)

285 Deflector Clearance (26-397)



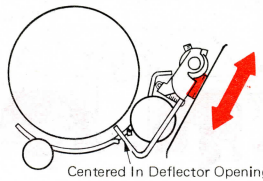
(E.S.C., MCC)

286 Deflector Support Bracket (26-330)



(E.S.C., MCC)

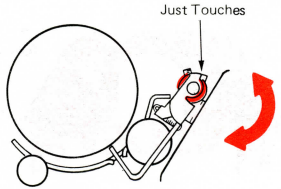
287 Paper Aligner Mounting Brackets (26-331)



Centered In Deflector Openings
And Align Paper Properly

(E.S.C., MCC)

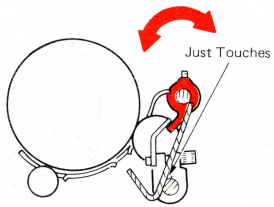
288 Paper Aligner Drive Collars (26-334)



Paper Release Lever Forward

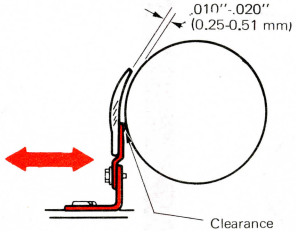
(E.S.C., MCC)

289 Center Drive Cam (26-392)



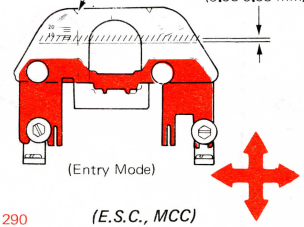
(E.S.C., MCC)

290 Cardholder Bracket (26-120)



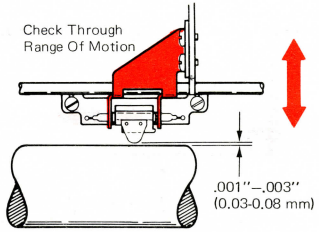
(E.S.C., MCC)

291 Cardholder (26-155)



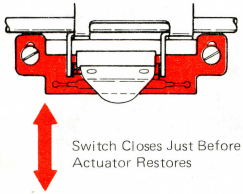
290 *(E.S.C., MCC)*

292 Actuator Bracket Assembly (26-304)

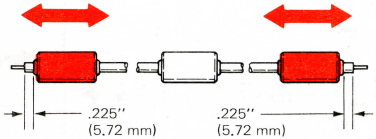


Paper Release Lever Forward

293 Actuator Reed Switch (26-305)

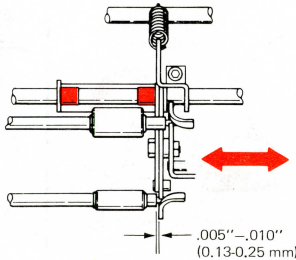


294 Feed Roll Assembly (26-71)

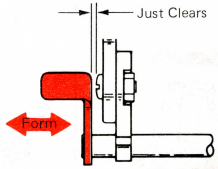


Rear Feed Roller Assemblies

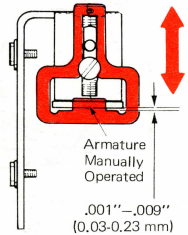
295 Feed Roll End Play (26-4)



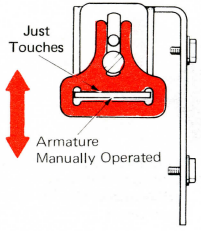
296 Shoe Rod (26-312)



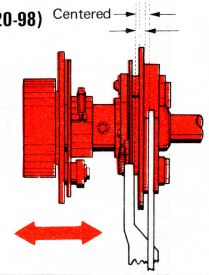
297 Index Magnet Pivot Plate (20-74)



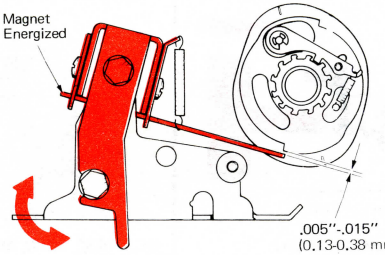
298 Index Magnet Armature Upstop (20-77)



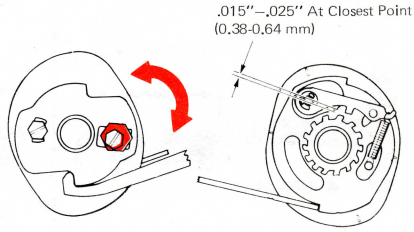
299 Index Cam Assembly (20-98)



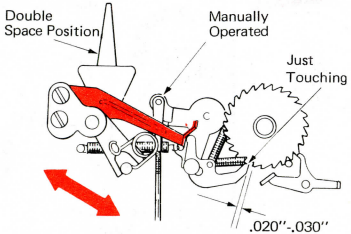
300 Index Cam Release Clearance (20-75)



301 Index Clutch Pawl Clearance (20-44)

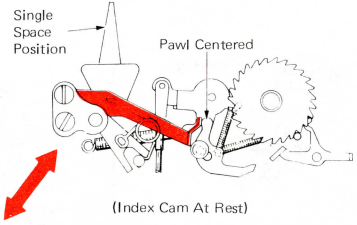


302 Linespace Cam Lever (Front-To-Rear) (20-84)



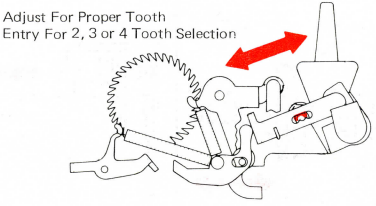
(MC, E/MC, MC II, MC/A, MEM/T)

303 Linespace Cam Lever (Vertical) (20-84)



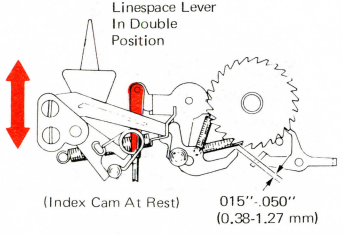
302 *(MC, E/MC, MC II, MC/A, MEM/T)*

304 Linespace Cam Lever (1-1/2 Index) (20-8)



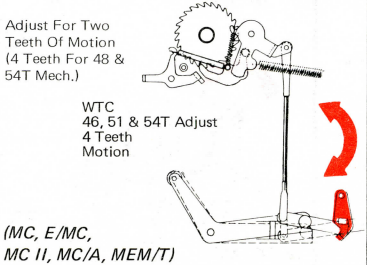
(MC, E/MC, MC II, MC/A, MEM/T)

305 Index Link (20-26)



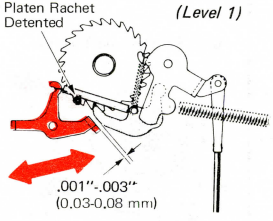
(MC, E/MC, MC II, MC/A, MEM/T)

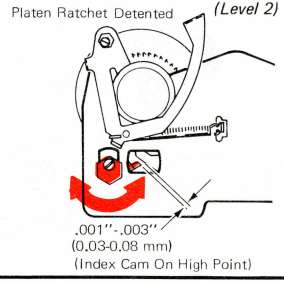
306 Multiplying Lever Stop (20-28)



(MC, E/MC, MC II, MC/A, MEM/T)

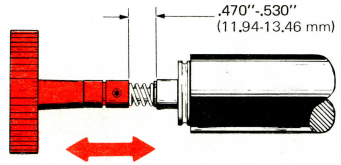
307 Platen Overthrow Stop (20-95)





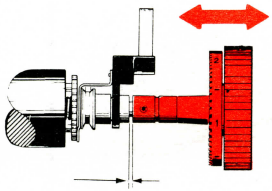
(MC, E/MC, MC II, MC/A, MEM/T)

308 Left Platen Knob (28-1)



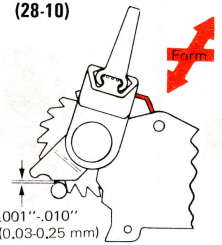
(MC, E/MC, MC II, MC/A)

309 Right Platen Knob (28-1)



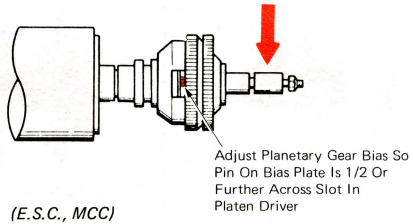
(MC, E/MC, MC II, MC/A)

310 Line Position Reset Lever (28-10)



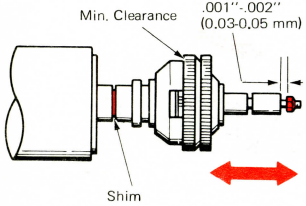
(MC, E/MC, MC II, MC/A)

311 Planetary Gear Bias (28-43)



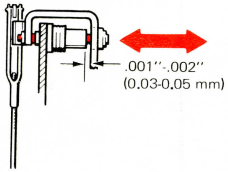
(E.S.C., MCC)

312 Ratchet End Play (28-37)



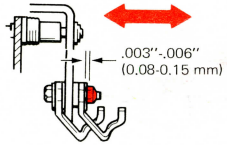
(E.S.C., MCC)

313 Pawl Carrier End Play (20-122)



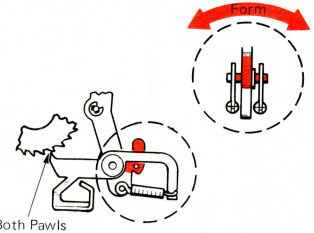
(E.S.C., MCC)

314 Index Pawl End Play (20–127)



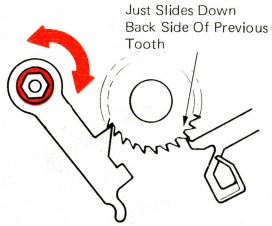
(E.S.C., MCC)

315 Equal Pawl Entry (20-129)



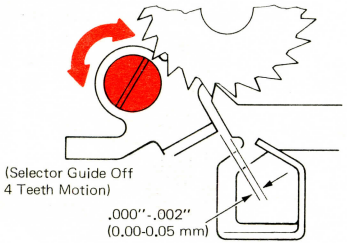
(E.S.C., MCC)

316 Ratchet Detents (20-143)



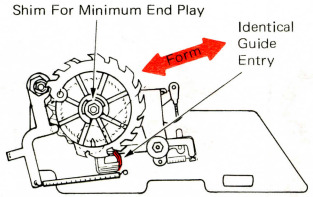
(E.S.C., MCC)

317 Overthrow Stop (20–134)



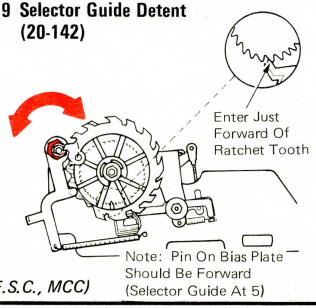
(E.S.C., MCC)

318 Selector Guide (20-125)



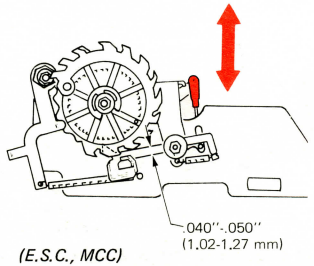
(E.S.C., MCC)

319 Selector Guide Detent (20-142)



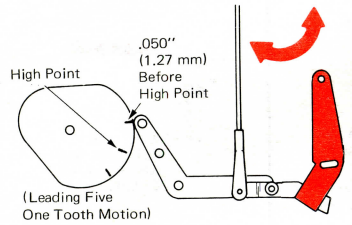
(E.S.C., MCC)

320 Index Link (20-26)



(E.S.C., MCC)

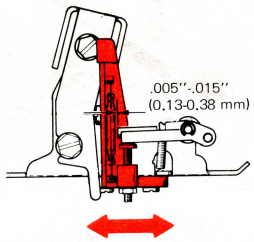
321 Multiplying Lever (20-28)



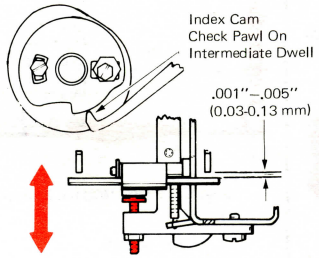
Note: W/O Selector Guide The Pawls Should Feed 4 Teeth

(E.S.C., MCC)

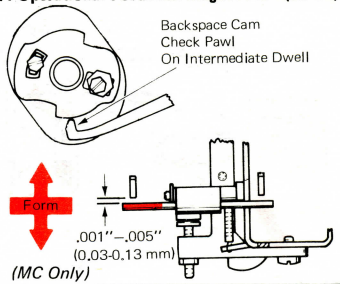
322 Operational Feedback Magnet (20-53)



323 Operational Feedback Stop Screw (20-57)

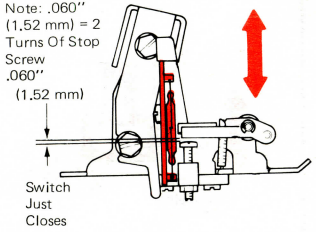


324 Operational Feedback Magnet Pin (20-62)

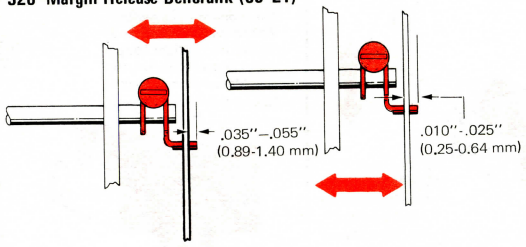


(MC Only)

325 Operational Feedback Circuit Board (20–52)

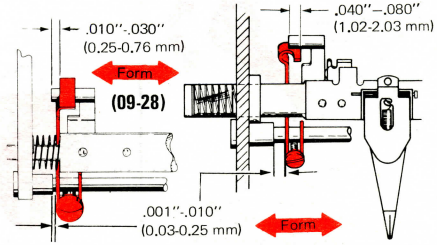


326 Margin Release Bellcrank (09-21)



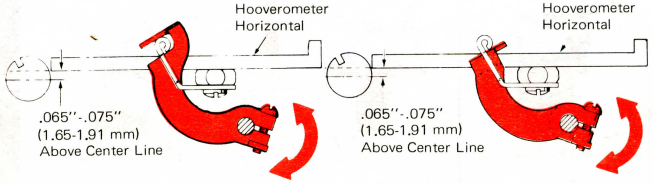
(WT 96 Char.)

327 Margin Release Arm (09-165)



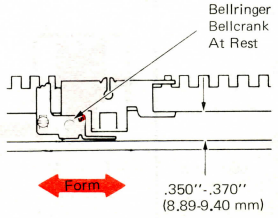
(MC) *(E/MC, MC II, MC/A, Mem/T)*

328 Margin Release Arm (09-28) (09-165)



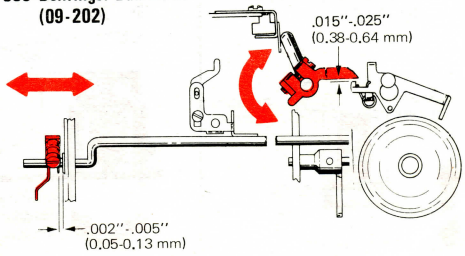
(MC) *(E/MC, MC II, MC/A, Mem/T)*

329 Bellringer Bellcrank Tab Stop (09–19)



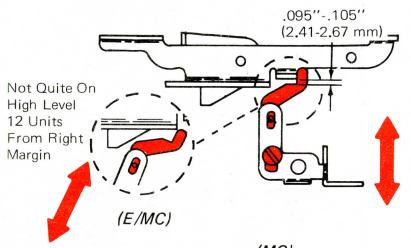
(MC, E/MC Level 2)

330 Bellringer Bail Lever (09-202)

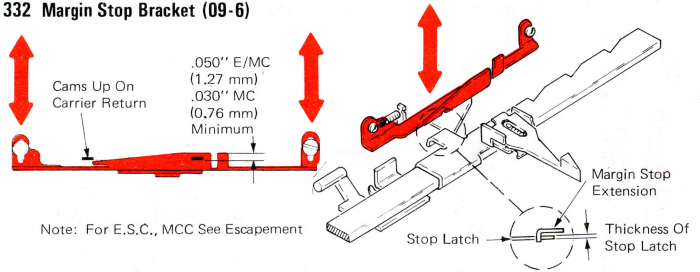


(MC, E/MC)

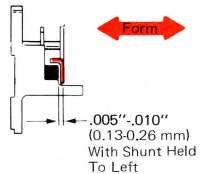
331 Bellringer Bellcrank Arm (09-18)



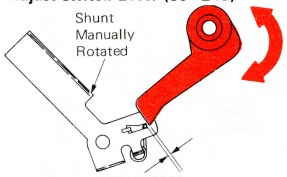
332 Margin Stop Bracket (09-6)



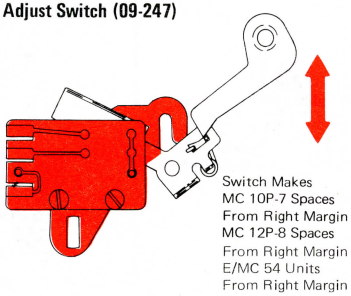
333 Adjust Switch Shunt (09-244)



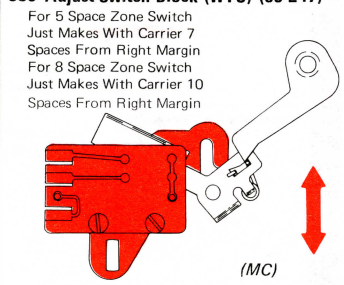
334 Adjust Switch Lever (09–243)



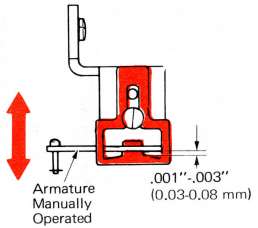
335 Adjust Switch (09-247)



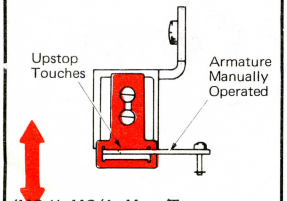
336 Adjust Switch Block (WTC) (09-247)



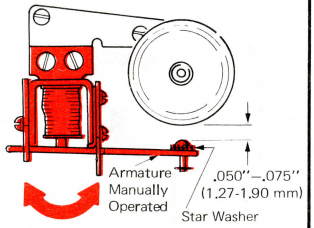
337 Bellringer Magnet Pivot Plate (09–227)



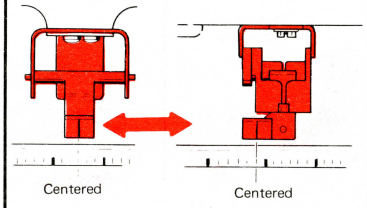
338 Bellringer Magnet Upstop (09–233)



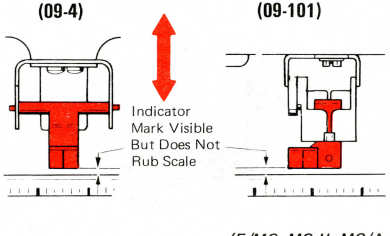
339 Bellringer Magnet Assembly Position (09–226)



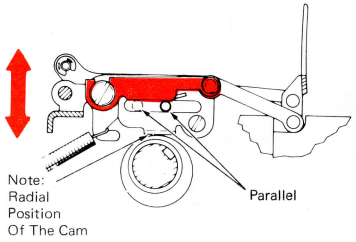
340 Carrier Pointer Left-To-Right (09–2) (09–105)



341 Carrier Pointer Front-To-Rear (09-4) (09-101)

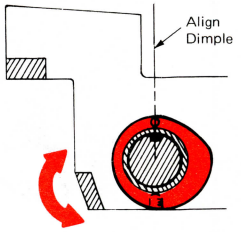


342 Ribbon Lift Guide Plate (13–15)



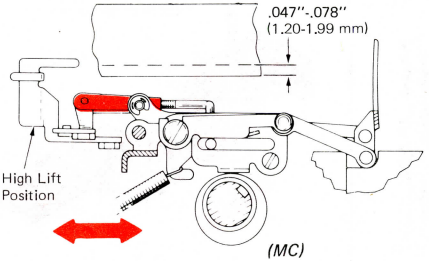
(MC)

343 Ribbon Lift Cam (13–25)



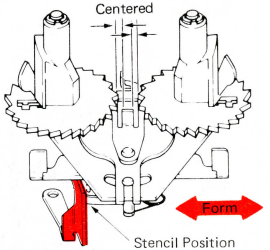
(MC)

344 Ribbon Lift Control Link (13–32)



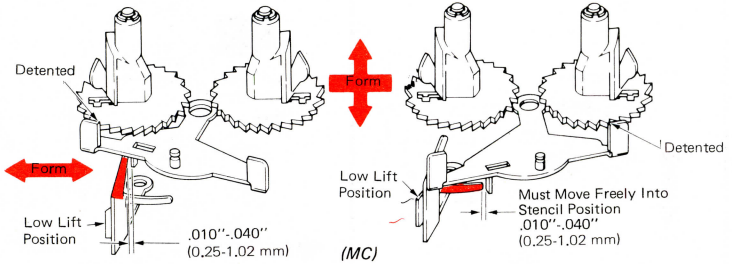
(MC)

345 Ribbon Lift Lever (13–27)



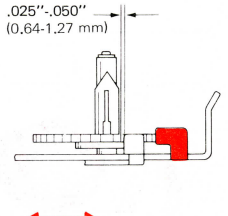
(MC)

346 Ribbon Lift Lever Lugs (13-27)



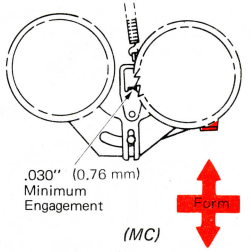
(MC)

347 Rachet Detent (13-36)



(MC)

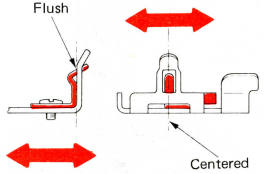
348 Rachet Detent (13-36)



346, 347

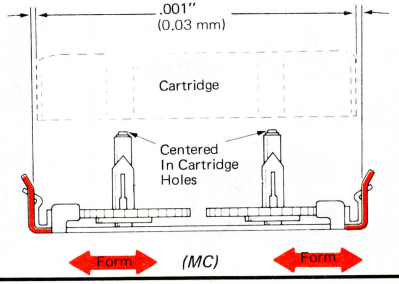
(MC)

349 Cartridge Retaining Springs (13-6)



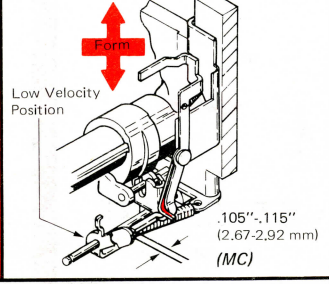
(MC)

350 Cartridge Guide Lugs (13-36)



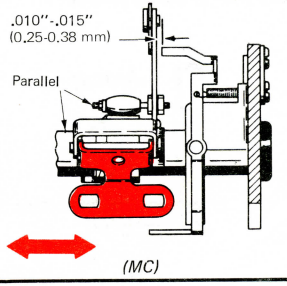
(MC)

351 Inhibitor Stop Lug (14–14)



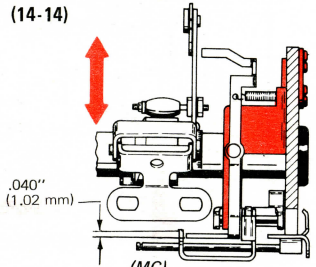
(MC)

352 Feed Pawl Bracket (14-16)



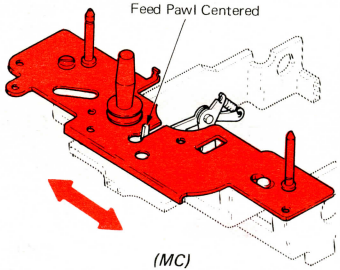
(MC)

353 Inhibitor Bracket Position (14-14)



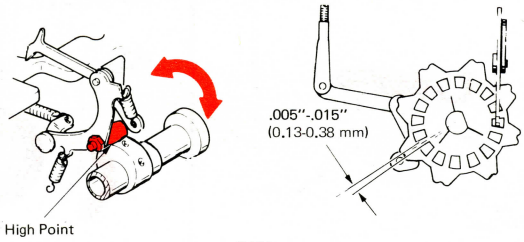
(MC)

354 Ribbon Feed Plate (14–71)



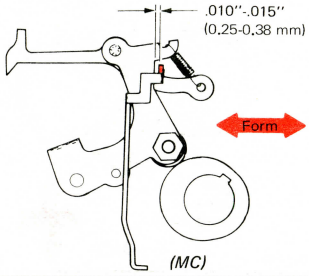
(MC)

355 Cam Follower Eccentric (14–46)



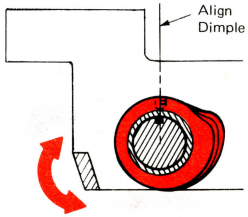
(MC)

356 Feed Inhibitor Lug (14-14)



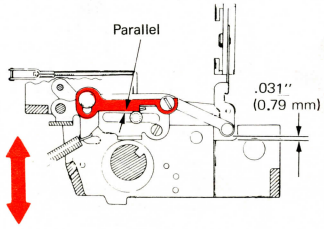
(MC)

357 Ribbon Lift Cam (14-49)



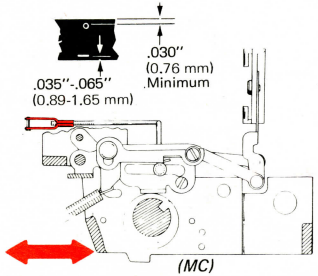
(MC)

358 Ribbon Lift Guide Plate (14-4)



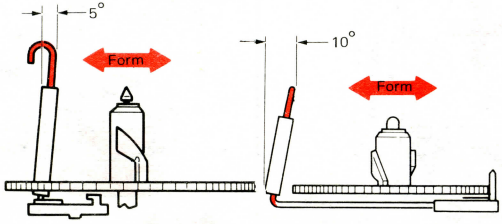
(MC)

359 Ribbon Lift Control Link (14-43)



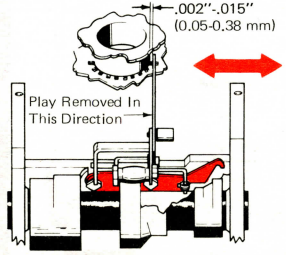
(MC)

360 Ribbon Shock Spring (14-61)

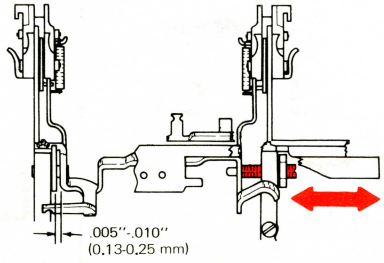


(Front View) (MC) (Left Side View)

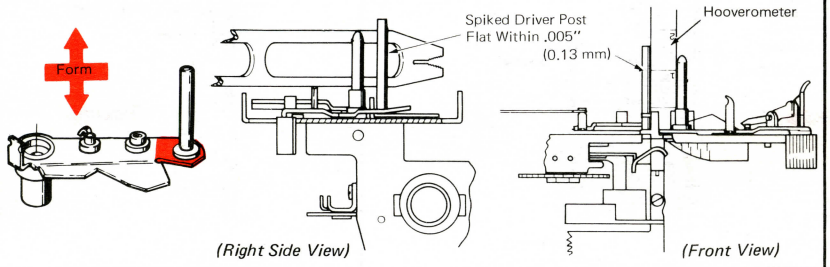
361 Feed Cam Follower Bracket (15-12)



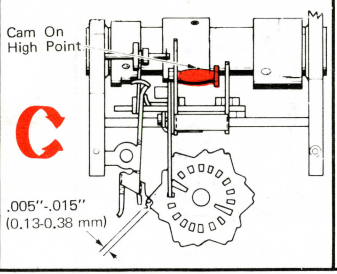
362 Lift Arm (15-6)



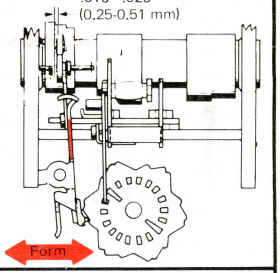
363 Spiked Driver Post (15-61)



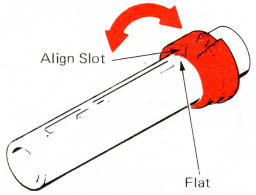
364 Feed Cam Follower Eccentric (15-126)



365 Lift Control Lever (15–76)

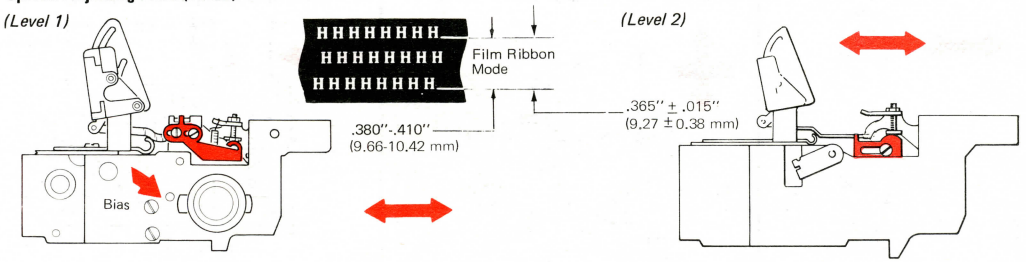


366 Ribbon Lift Cam (15-17)

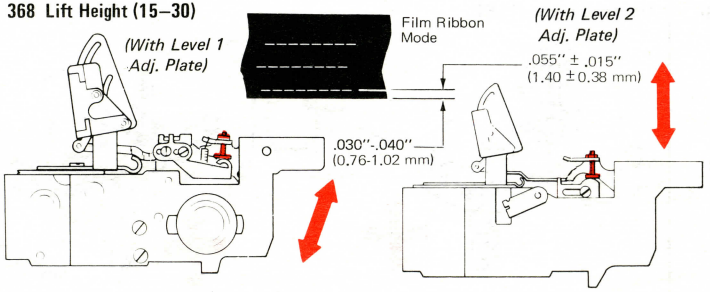


99

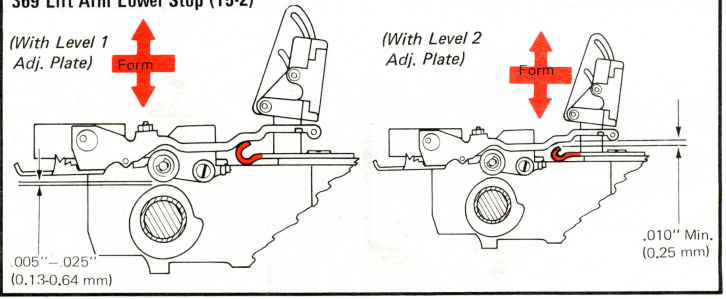
367 Spread Adjusting Plate (15-22)



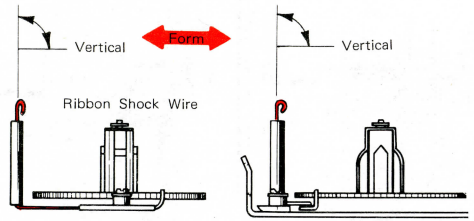
368 Lift Height (15–30)



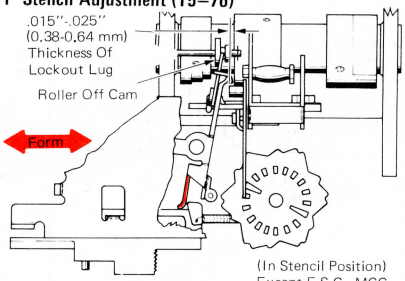
369 Lift Arm Lower Stop (15-2)



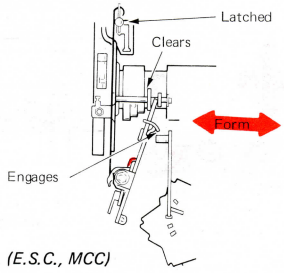
370 Shock Wire (15-83)



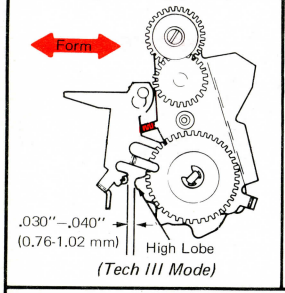
371 Stencil Adjustment (15–76)



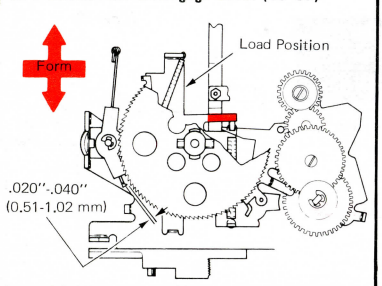
372 Ribbon Control Lever (15–37)



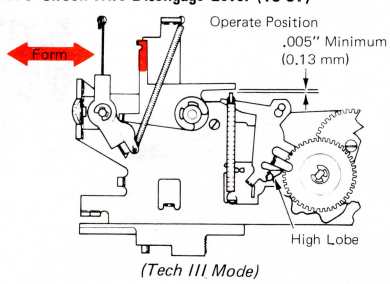
373 Swing Arm Lug (15-61)



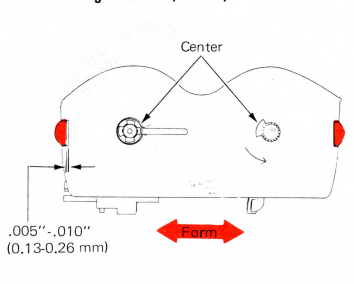
374 Shock Wire Disengage Lever (15-87)



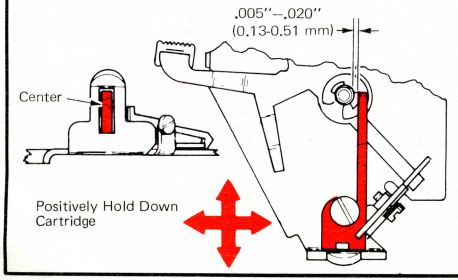
375 Shock Wire Disengage Lever (15-87)



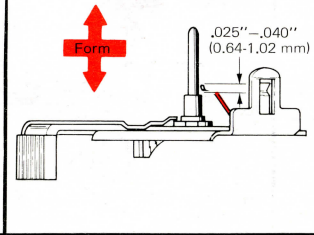
376 Cartridge Guides (15-86)



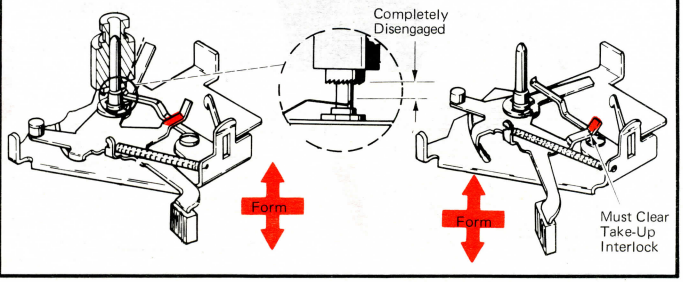
377 Cartridge Retaining Springs (15-59)



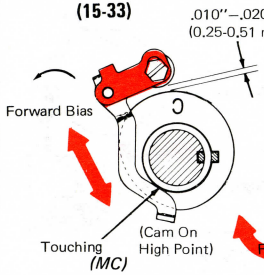
378 Take-Up Core Interlock (15-59)



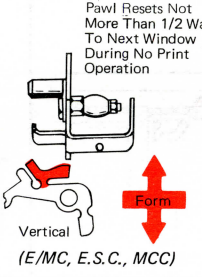
379 Load Lever (15-64)



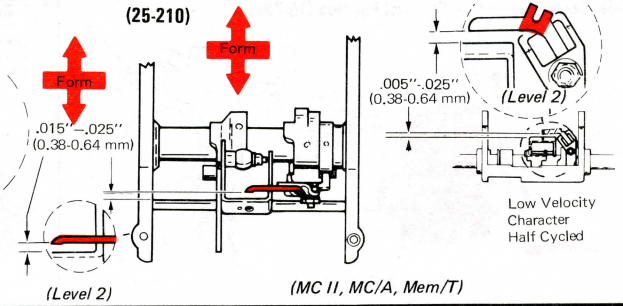
380 Ribbon Feed Inhibitor (15-33)



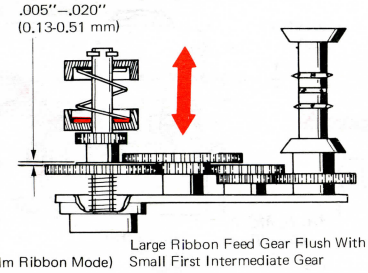
(15-131)



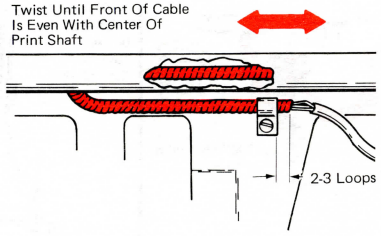
(25-210)



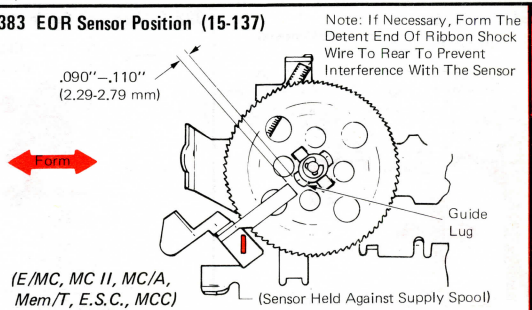
381 Mode Button Grip Clip Position (15-93)



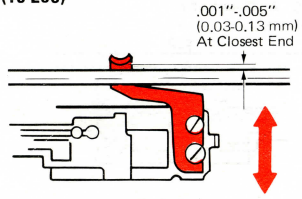
382 EOR Cable Position (15-139)



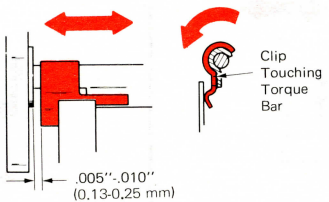
383 EOR Sensor Position (15-137)



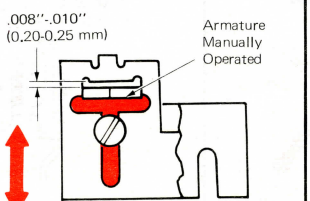
384 Correcting Torque Bar Back Stop (15-286)



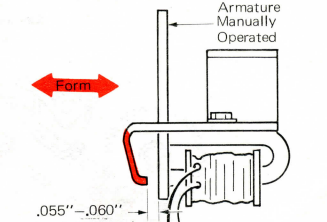
385 Correcting Torque Bar Trigger (15-283)



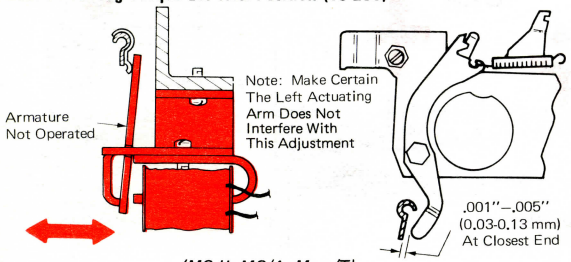
386 Correcting Magnet Pivot (15-279)



387 Correcting Magnet Up Stop (15-280)

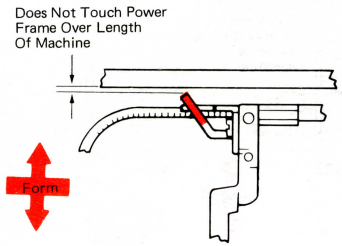


388 Correcting Torque Bar Rest Position (15-280)



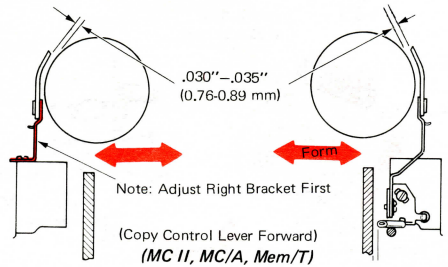
(MC II, MC/A, Mem/T)

389 Cable Guide Bracket (15-259)



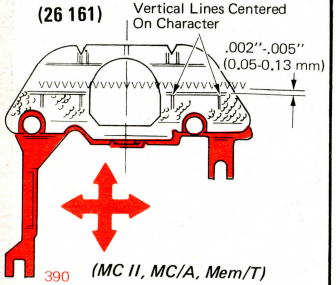
(MC II, MC/A, Mem/T)

390 Cardholder Bracket (26-161)



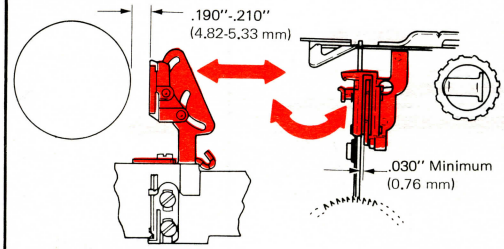
(MC II, MC/A, Mem/T)

391 Cardholder (26 161)



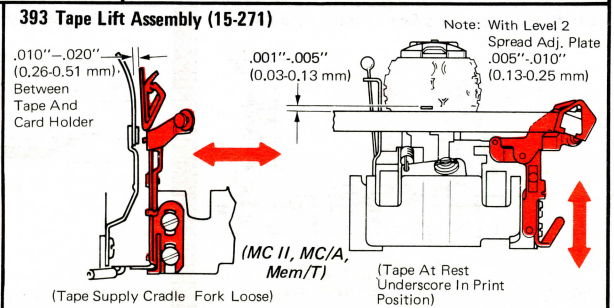
(MC II, MC/A, Mem/T)

392 Ribbon Lift Guide (15-272)



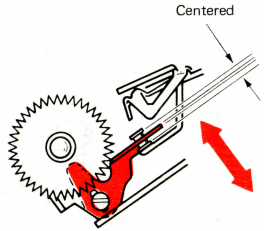
(MC II, MC/A, Mem/T)

393 Tape Lift Assembly (15-271)



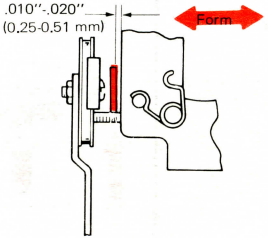
(MC II, MC/A, Mem/T)

394 Tape Supply Cradle Fork (15-233)



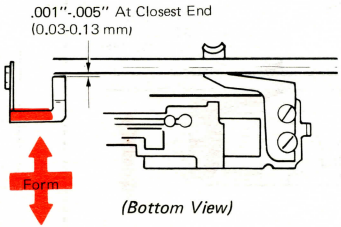
(MC II, MC/A, Mem/T)

395 Cable Guide Lug (15-271)



(MC II, MC/A, Mem/T)

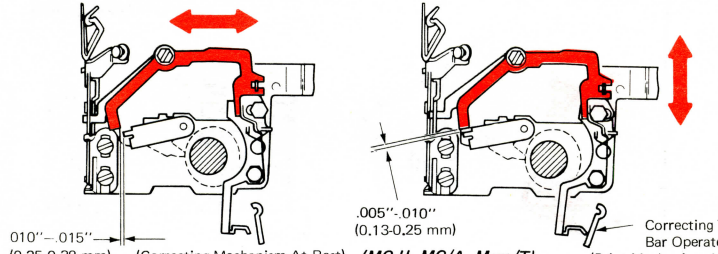
396 Lift Actuating Arm (15–266)



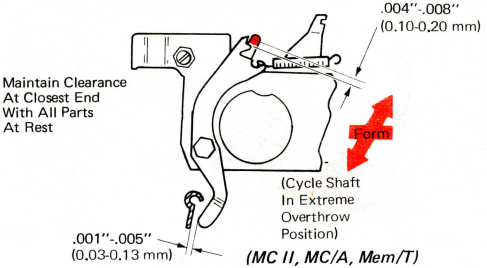
(Bottom View)

(MC II, MC/A, Mem/T)

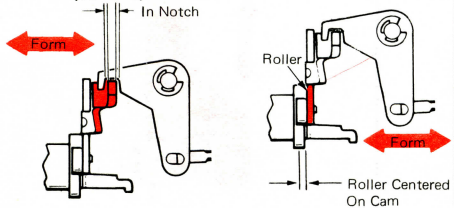
397 Lift Arm Latch (15-262)



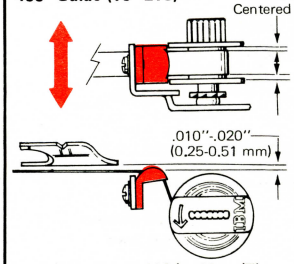
398 Tape Feed Cam Follower — Front Lug (15-245)



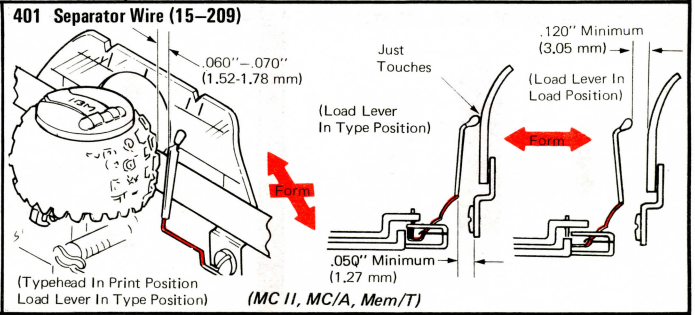
399 Tape Feed Cam Follower Rear Lug & Roller (15-245) (15-213)



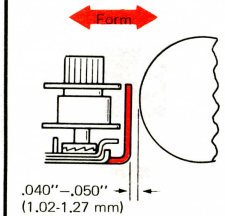
400 Guide (15–213)



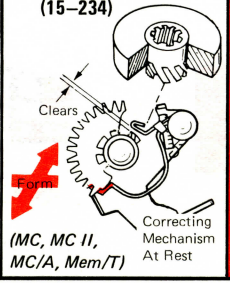
401 Separator Wire (15–209)



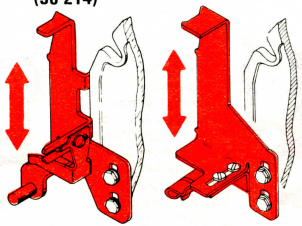
402 Paper Guide Lug (15-220)



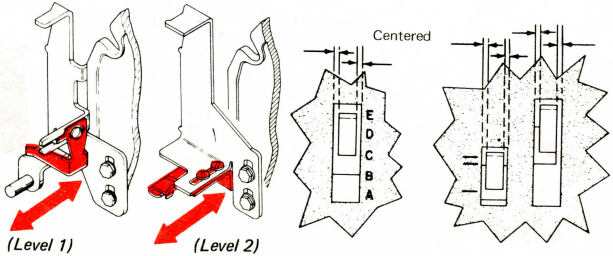
403 High Bias Spring (15–234)



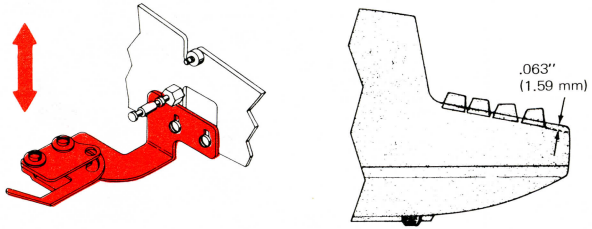
404 Rear Mounting Brackets (30 214)



405 Rear Mounting Brackets (30–213)

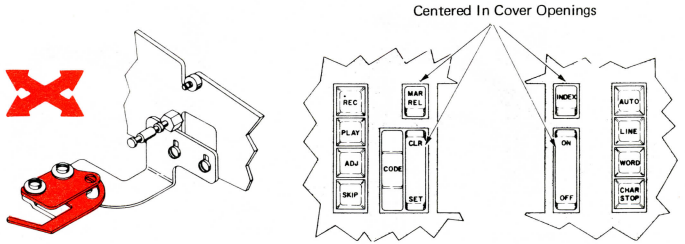


406 Front Mounting Brackets (30-208)



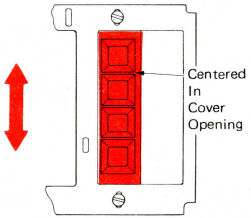
(Level 1)

407 Front Mounting Brackets (30-206)

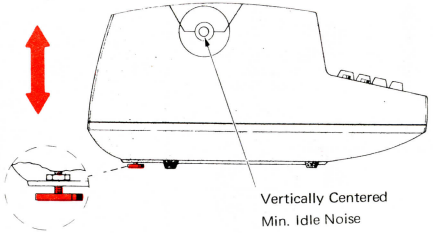


(Level 1)

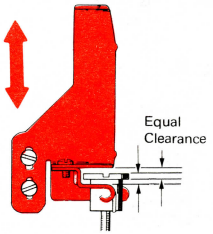
408 Any Single Row Of Buttons (22-311)



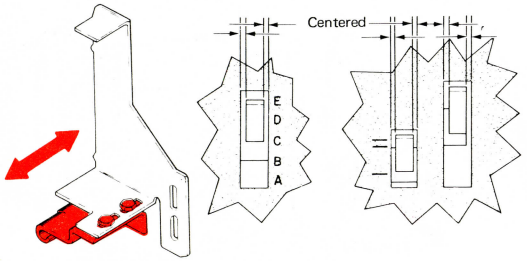
409 Floating Cover – Rear Feed (30-63)



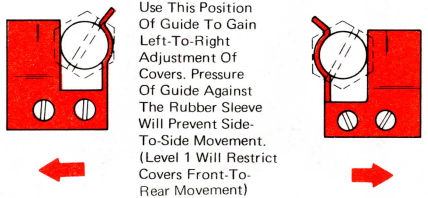
410 Floating Cover – Rear Bracket (30-214)

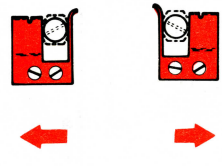


411 Floating Cover – Rear Guides (30-220)



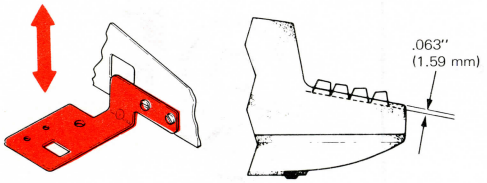
(Level 1)



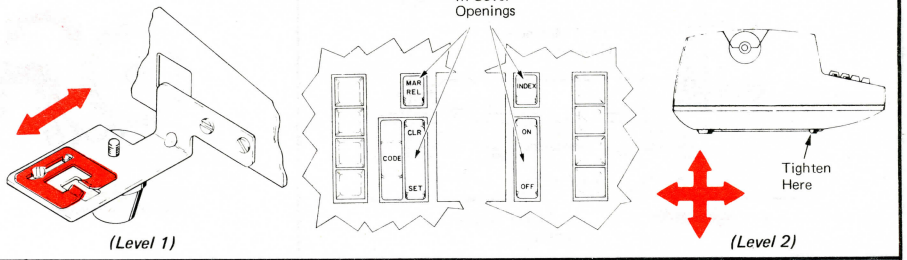


(Level 2)

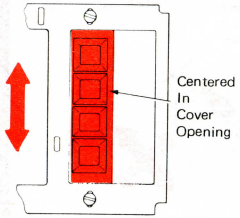
412 Floating Cover — Front Cover Bracket (30-216)



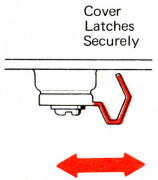
413 Floating Cover — Front Cover Guide (30-201)



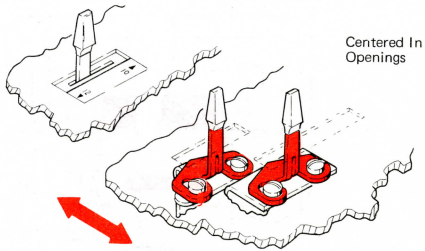
414 Any Single Row Of Buttons (22-311)



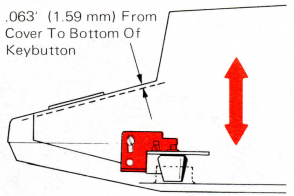
415 Top Cover Latch (30-35)



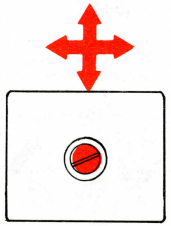
416 Levers (26—256)



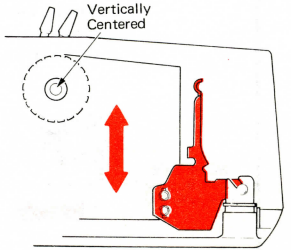
417 Front Mounting Bracket (30-393)



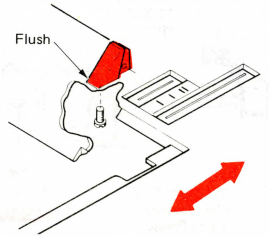
418 Front Feet (30-390)



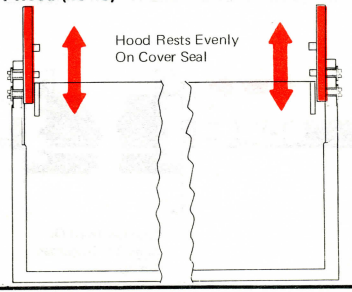
419 Rear Mounting Brackets (30-388)



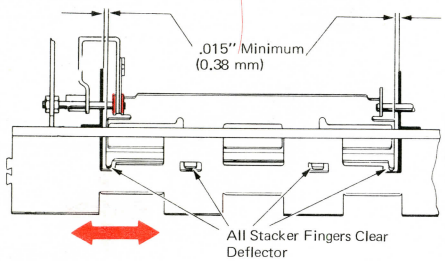
420 Mounting Plates (40-46)



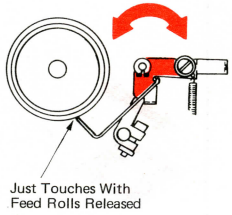
421 Hood (40-48)



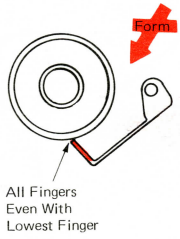
422 Paper Stacker (26-203)



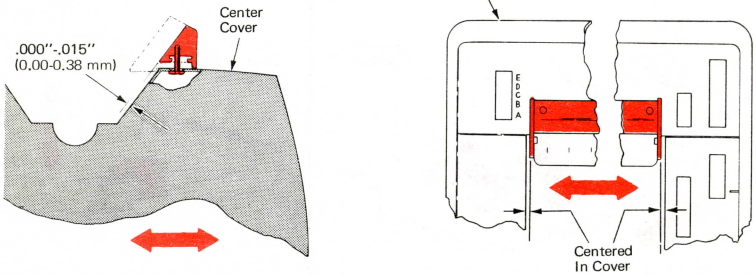
423 Paper Stacker Follower (26-217)



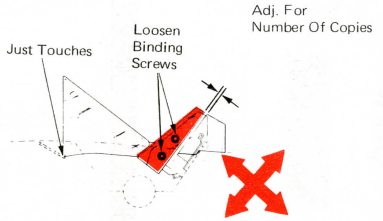
424 Paper Stacker Fingers (26-203)



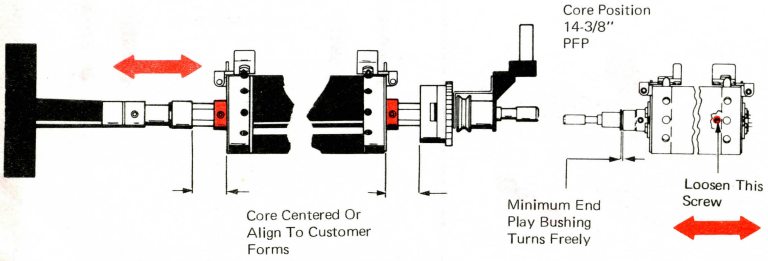
425 Support Bar (40-2)



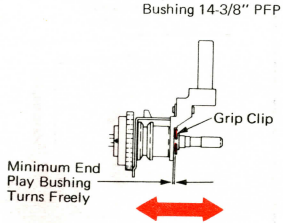
426 Filter Position (40–9)



427 Pinfeed Platen Core– Lateral Position (28–52)



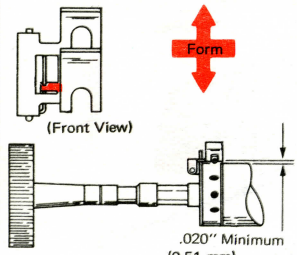
428 Bushing (28-54)



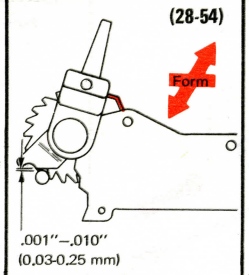
429 Pinwheel Assembly (28-87)



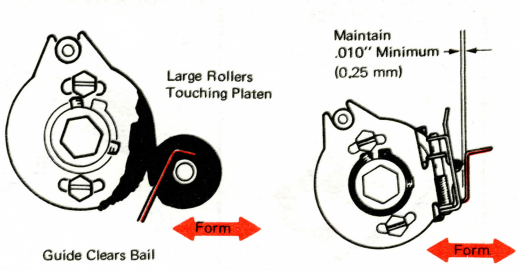
430 Paper Guide Latch (28-60)



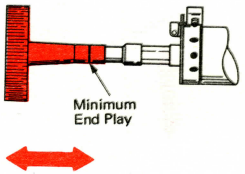
431 Line Position Reset Lever (28-54)



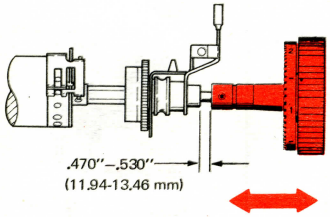
432 Paper Guides (28–60)



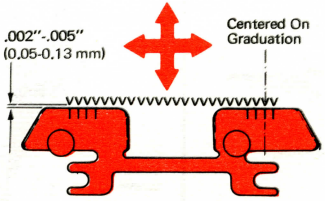
433 Left Platen Knob (28–1)



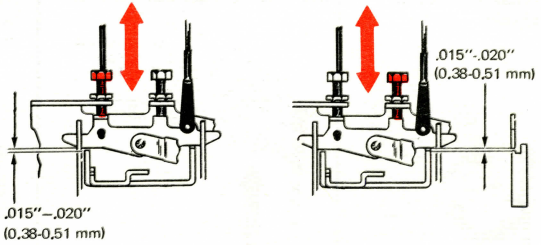
434 Right Platen Knob (28-1)



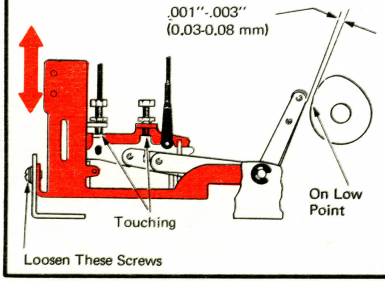
435 Pinfeed Cardholder (28-80)



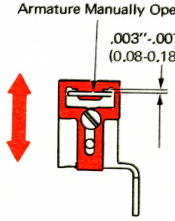
436 Index Lever Stop Screw (21-115)



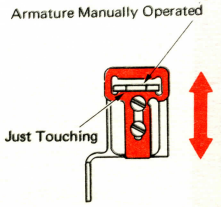
437 Reverse Index Bracket (21-45)



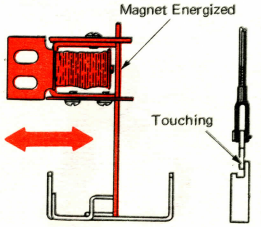
438 Reverse Index Pivot Plate (21–32)



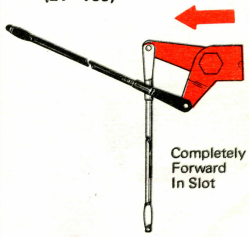
439 Reverse Index Upstop (21–40)



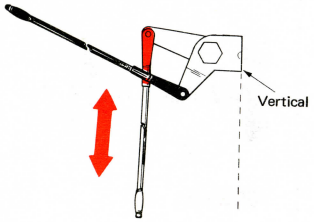
440 Reverse Index Magnet Position (21–36)



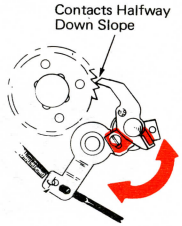
441 Index Intermediate Bellcrank (21–106)



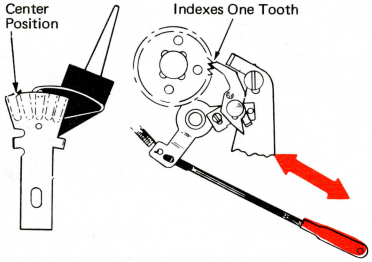
442 Reverse Index Intermediate Link (21-134)



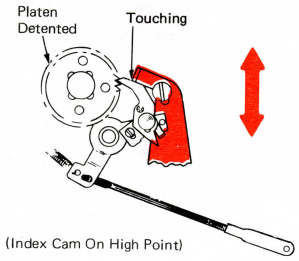
443 Reverse Index Pawl Locator (21–135)



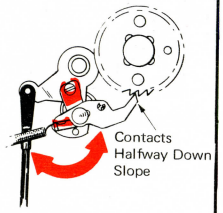
444 Reverse Index Link (21-111)



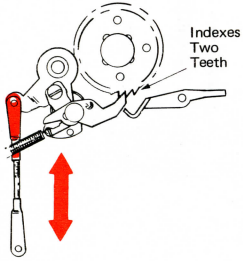
445 Reverse Overthrow Stop (21-83)



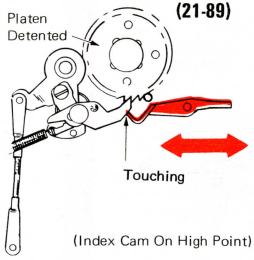
446 Forward Index Pawl Locator (21-1)



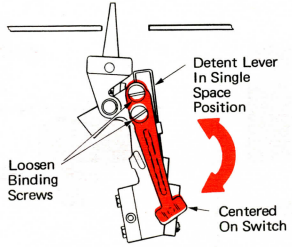
447 Forward Index Link (21-132)



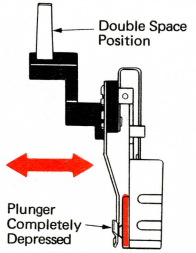
448 Forward Overthrow Stop (21-89)



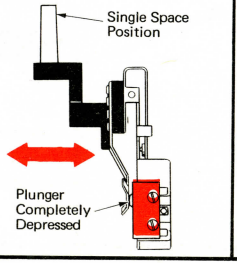
449 Index Selector Lever Cam (21-15)



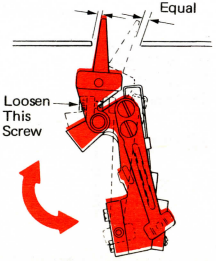
450 Double Space Switch (21-10)



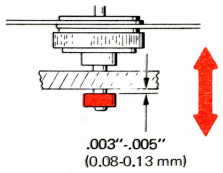
451 Single Space Switch (21-10)



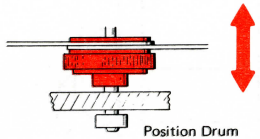
452 Index Selector Lever (21-5)



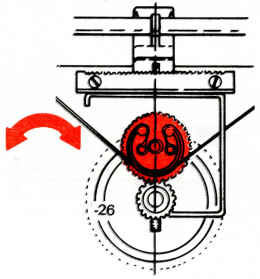
1 Selector Tape Drum Shaft (75-28)



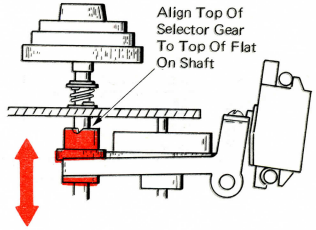
2 Selector Tape Drum (75-44)



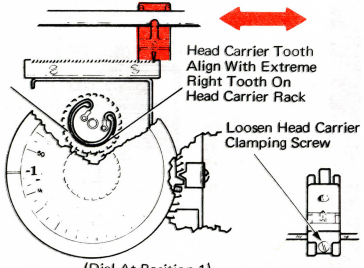
3 Selector Tape Drum (75-44)



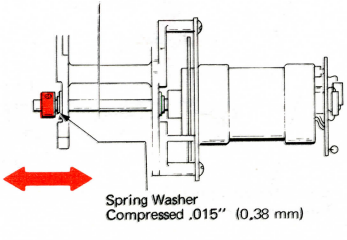
4 Dial Shaft Spring Force (75-50)



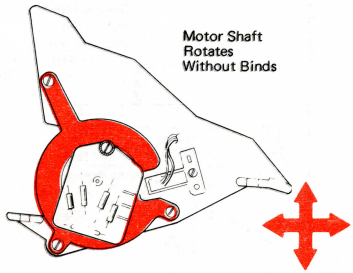
5 Head Carrier (75-11)



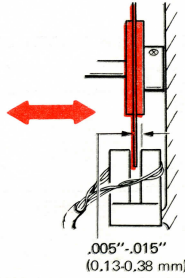
6 Motor Shaft (75-24)



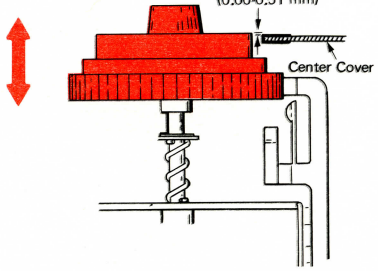
7 Motor Mounting Bracket (75-42)



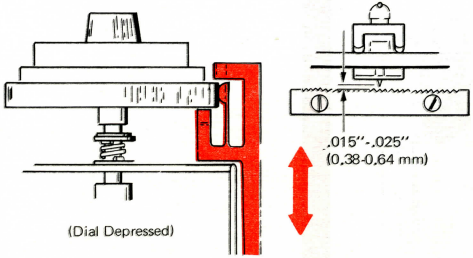
8 Emitter Wheel (75-34)



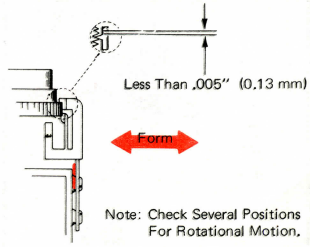
9 Selector Dial (75-62)



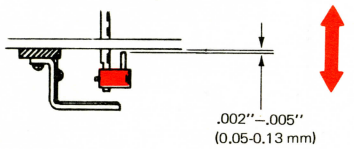
10 Detent/Final Stop (75-13)



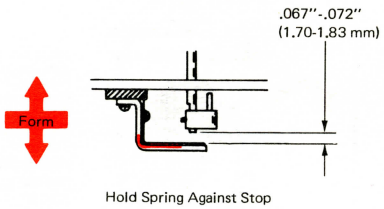
11 Track Step Detent (Level 2 & Memory 100)



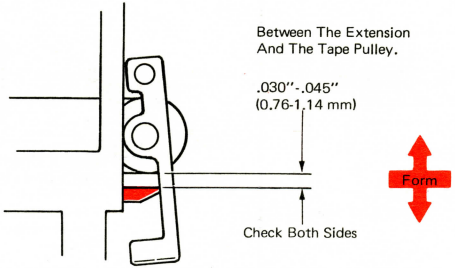
12 Section Select Collar — End Play (Memory 100)



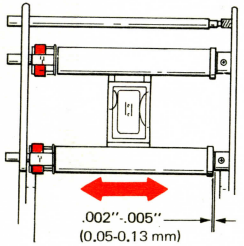
13 Section Select Shaft Stop (Memory 100)



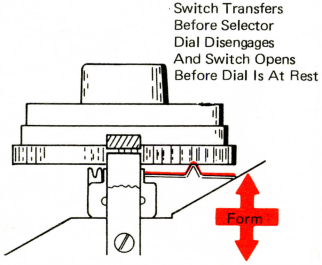
14 Yoke Extensions (Memory 100)



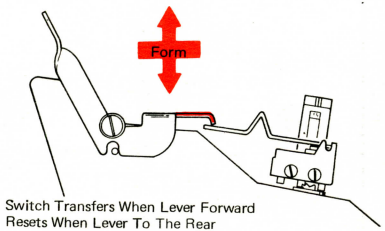
15 Guide Roller End Play (75-5)



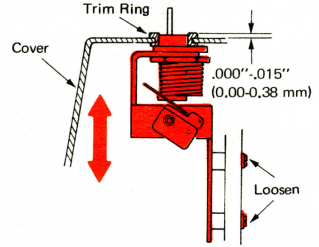
16 Selector Dial Switch (75–55)



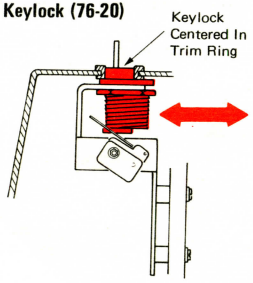
17 Tape Security Lever (75-1)



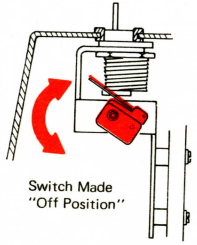
18 Switch And Bracket Assembly (76-35)

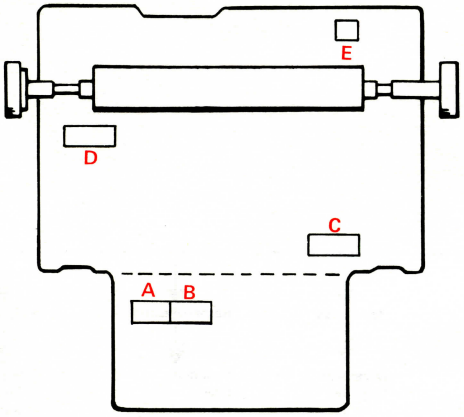


19 Keylock (76-20)

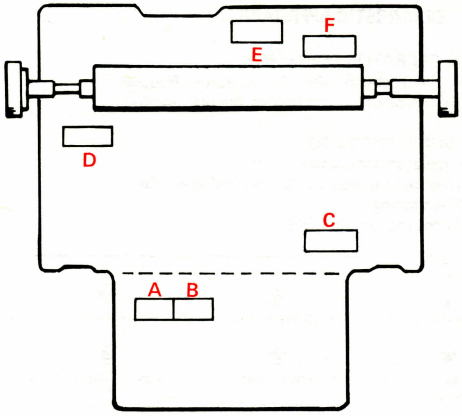


20 Switch (76-24)

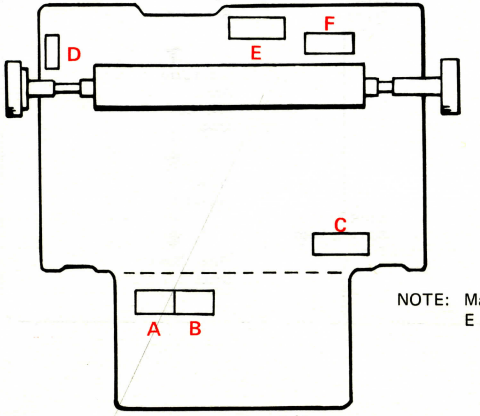




MC

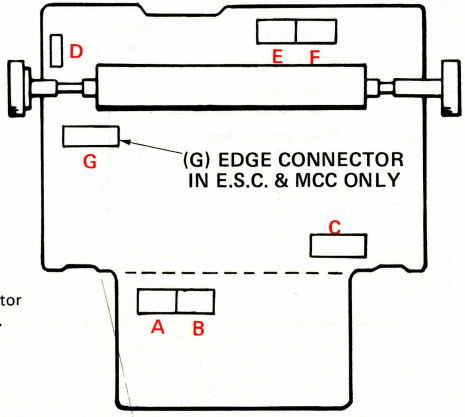


E/MC



MAG II MAG/A

NOTE: Mag II, Mag A May Have Edge Connector E And F Similar To MEM/T And ESC.

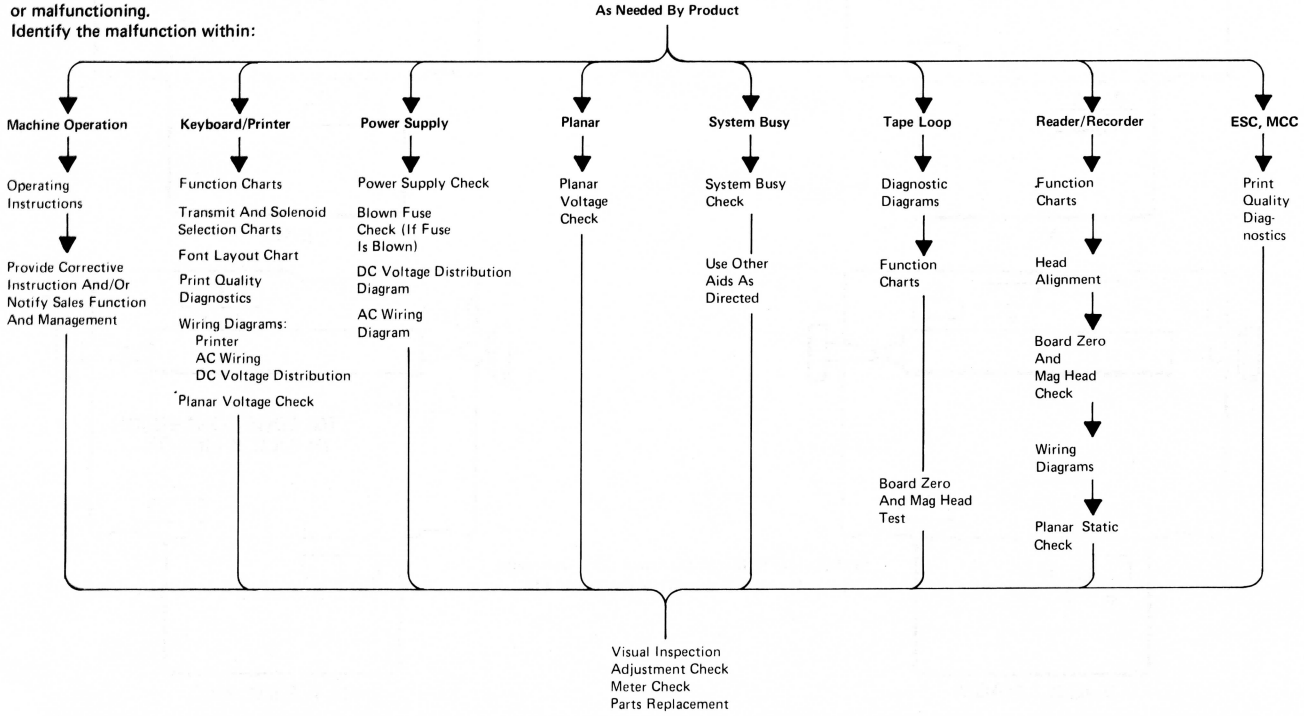


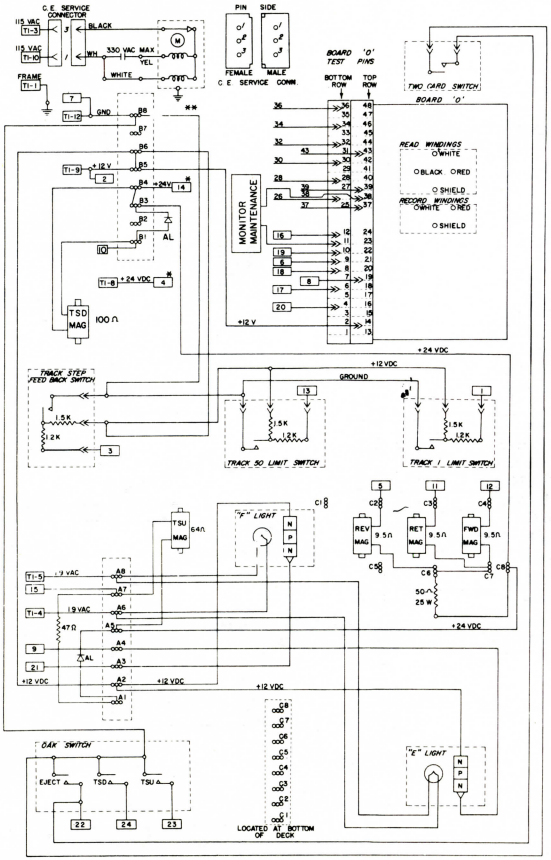
MEM/T, E.S.C., MCC

DIAGNOSTIC APPROACH

1. CONSIDER OPERATOR COMMENTS
   A. Discuss the problem with the operator. Request example and/or demonstration of the malfunction.

2. USE THE QUICK CHECK TO
   A. Verify operator comments.
   B. Determine that the machine is functioning normally or malfunctioning.
   C. Identify the malfunction within:



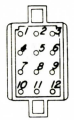


PIN ASSIGNMENT			
PIN	NAME	PIN	NAME
1	TK1 Limit Sw.	13	TK50 Limit Sw.
2	+12 VDC T1-9	14	+24 VDC B-4
3	TK Step FB	15	TSU Mag.
4	+24 V — T1-8	16	Bd. '0' Pin 12
5	Rev. Mag.	17	Bd. '0' Pin 6
6	Bd. '0' Pin 9	18	Bd. '0' Pin 8
7	T1-12 Grd.	19	Bd. '0' Pin 10
8	Bd. '0' Pin 19	20	Bd. '0' Pin 4
9	'E' Light A-4	21	'F' Light A-3
10	TSD Mag.	22	Eject Kb.
11	Ret. Mag.	23	TSU Kb.
12	Fwd. Mag.	24	TSD Kb.
NOT USED		NOT USED	
25		37	
26		38	
27		39	
28		40	
29		41	
30		42	
31		43	
32		44	
33		45	
34		46	
35		47	
36		48	

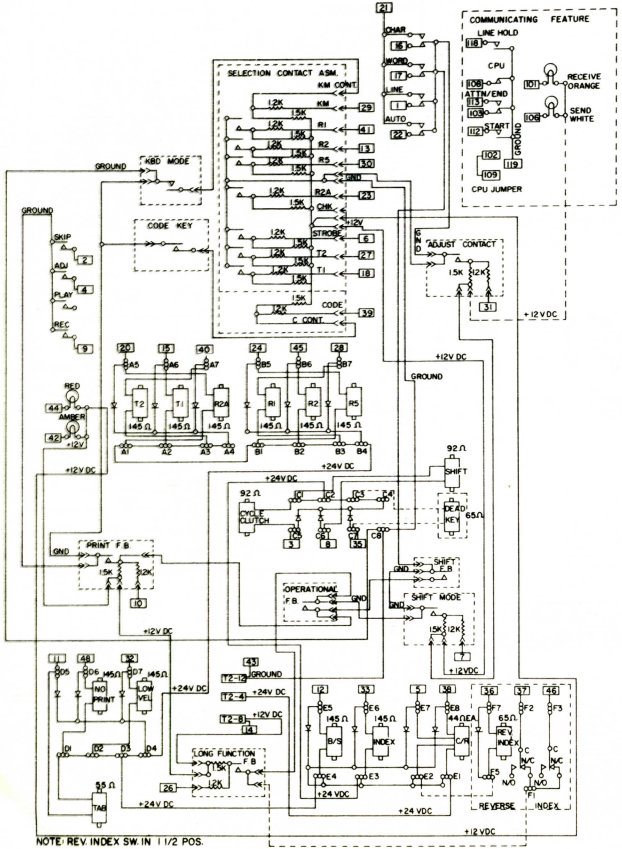
COLOR CODE
+24 VDC — Red
+12 VDC — Gray
Ground — Black
1.9 VAC — Black

POWER SUPPLY PIN ASSIGNMENT		
Name	T1	T2
Frame Ground		
Green/Yellow	1	1
AC Black	3	3
1.9 VAC Black	4	
1.9 VAC Black	5	
+24 V Red	8	4
+12 V Gray	9	8
AC White	10	10
Ground Black	12	12

R/R T1 CONNECTOR	
PIN	ASSIGNMENT
T1-1	Ground Gr./Yel.
T1-3	115 VAC Black
T1-4	1.9 VAC Black
T1-5	1.9 VAC Black
T1-8	+24 VDC Red
T1-9	+12 VDC Gray
T1-10	115 VAC White
T1-12	Ground



R/R T1 CONNECTOR AT POWER SUPPLY PIN SIDE MALE PLUG

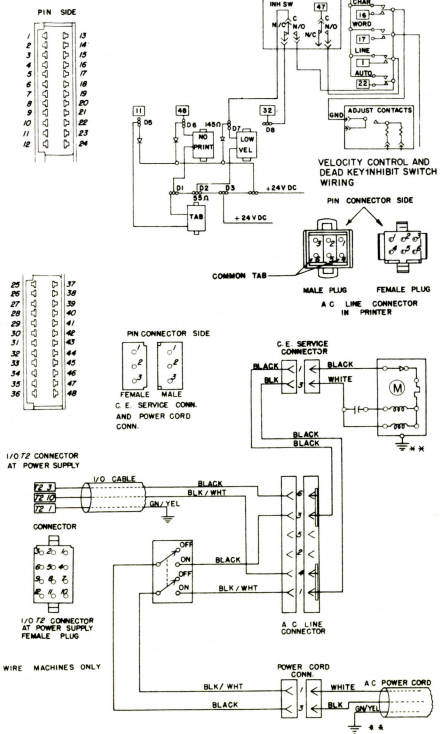


I/O CABLE CONN. PLANAR BOARD

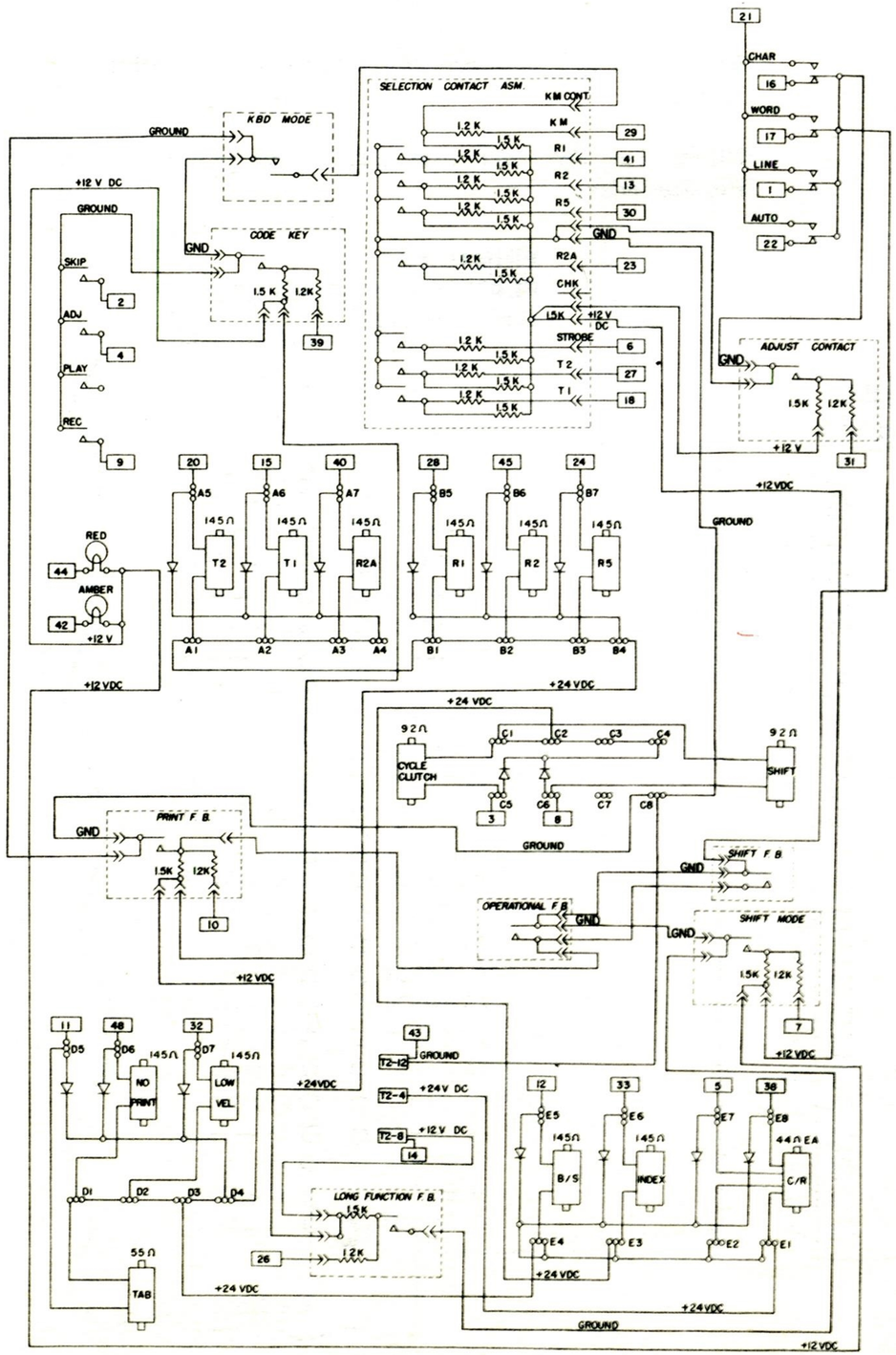
PIN ASSIGNMENT			
PIN	NAME	PIN	NAME
1	Line	13	R2 Cont.
2	Skip	14	Pin 8 T2 Conn.
3	C/C Mag.	15	T1 Mag.
4	Adjust	16	Char.
5	C/R Mag.	17	Word
6	Strobe	18	T1 Cont.
7	Shift Mode	19	Spare
8	Shift Mag.	20	T2 Mag.
9	Record	21	Sec. Mode
10	P/O/S FB	22	Auto
11	Tab Mag.	23	R2A Cont.
12	B/S Mag.	24	R5 Mag.
25	Spare	37	Spare
26	Long Funct.	38	C/R Mag.
27	T2 Cont.	39	Code Key
28	R1 Mag.	40	R2A Mag.
29	Kbd. Mode	41	R1 Cont.
30	R5 Cont.	42	No Card
31	Adj. Mode	43	Pin 12 T2 Conn.
32	Low Vel.	44	Error
33	Index Mag.	45	R2 Mag.
34	Spare	46	Spare
35	Spare	47	Spare
36	Spare	48	No Print

I/O T2 CONNECTOR

POWER SUPPLY PIN ASSIGNMENT	
PIN	NAME
1	Frame Ground Green/Yellow
3	AC Black
4	+24 V Red
8	+12 V Gray
10	AC White
12	Ground Black

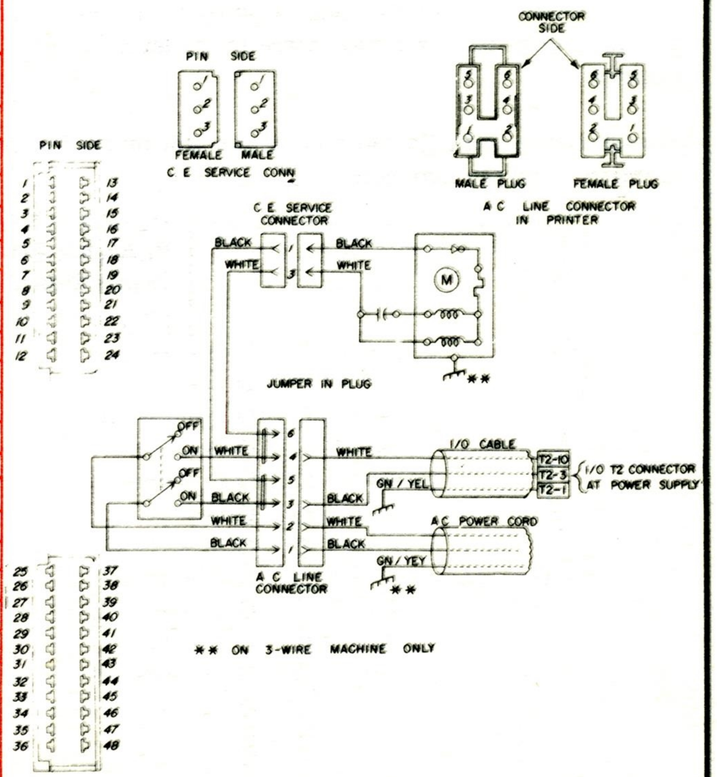


Arc Suppression Diodes — Forward Res. RX1 Scale 25 — 35 Ω
Reverse Res. R x 1K Scale 500 K Ω — ∞



I/O CABLE CONN. PLANAR BOARD

PIN ASSIGNMENT			
PIN	NAME	PIN	NAME
1	Line	13	R2 Cont.
2	Skip	14	Pin 8 T2 Conn.
3	C/C Mag.	15	T1 Mag.
4	Adjust	16	Char.
5	C/R Mag.	17	Word
6	Strobe	18	T1 Cont.
7	Shift Mode	19	Spare
8	Shift Mag.	20	T2 Mag.
9	Record	21	Sec. Mode
10	P/O/S FB	22	Auto
11	Tab Mag.	23	R2A Cont.
12	B/S Mag.	24	R5 Mag.
25	Spare	37	Spare
26	Long Funct.	38	C/R Mag.
27	T2 Cont.	39	Code Key
28	R1 Mag.	40	R2A Mag.
29	Kbd. Mode	41	R1 Cont.
30	R5 Cont.	42	No Card
31	Adj. Mode	43	Pin 12 T2 Conn.
32	Low Vel.	44	Error
33	Index Mag.	45	R2 Mag.
34	Spare	46	Spare
35	Spare	47	Spare
36	Spare	48	No Print

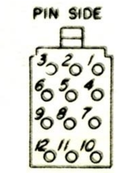


** ON 3-WIRE MACHINE ONLY

I/O T2 CONNECTOR

POWER SUPPLY

PIN ASSIGNMENT	
PIN	NAME
1	Frame Ground Green/Yellow
3	AC Black
4	+24 V Red
8	+12 V Gray
10	AC White
12	Ground Black



I/O T2 CONNECTOR AT POWER SUPPLY FEMALE PLUG

ARC SUPPRESSION DIODES - FORWARD RES. RX1 SCALE 25 – 35 Ω
REVERSE RES. RX1K SCALE 500KΩ – ∞

NOTE: REFER TO LEVEL 2 PRINT FOR REVERSE INDEX, DEAD KEY AND VELOCITY CONTROL & COMMUNICATING FEATURE

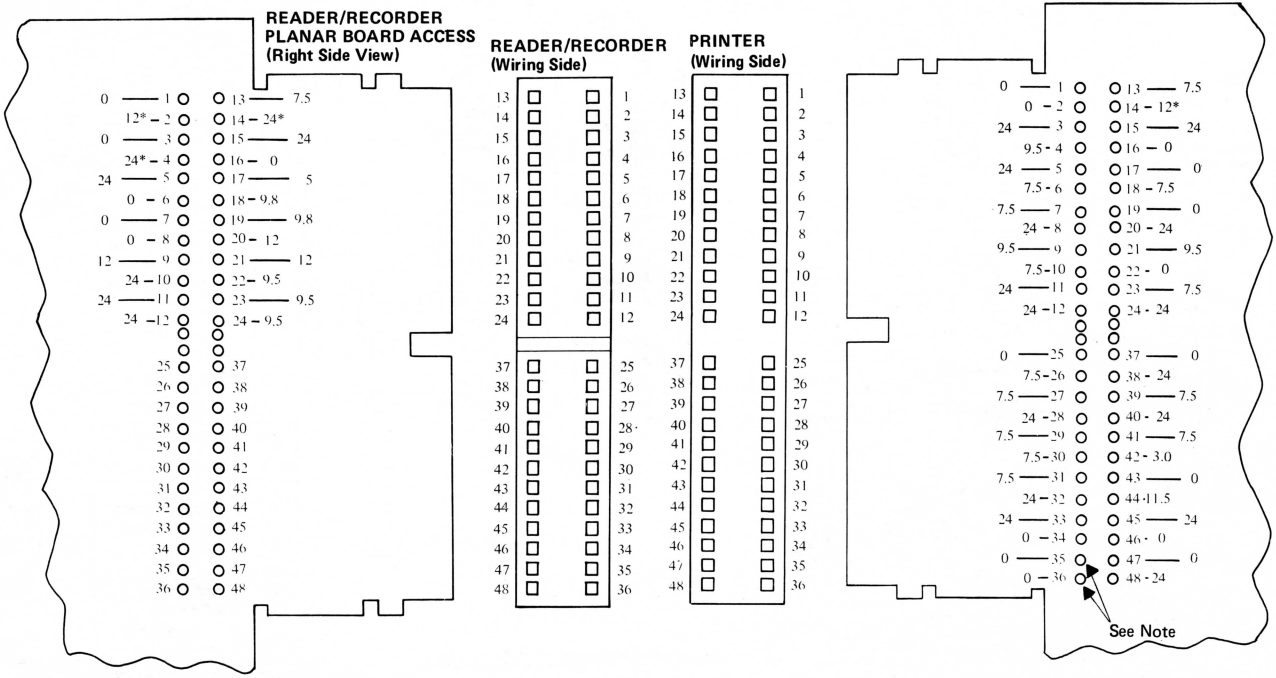
PLANAR PACKAGE STATIC VOLTAGE CHECK

All voltages are DC ±20%, except supply* voltages ±10%. All readings are taken with the meter on the 30VDC scale, the system in skip, the magnetic head in track 1, no card loaded and the printer and keyboard in lower case. Machines with reverse index, place index lever in the 1-1/2 position.

Printer cables with 24 pin connectors will retain the same numbers as 48 pin connectors.

NOTE: Pin 35P will read 24VDC on machines with Dead Key.

NOTE: Pin 36P will read 24VDC on machines with Reverse Index.



QUICK CHECK
PERFORM EACH STEP IN SEQUENCE

PROCEDURE	MACHINE RESPONSE	INDICATION	IF MALFUNCTION — GO TO
1. MACHINE SETUP: A. Machine "Off" B. "Play" Down C. No Card Loaded			
2. Turn Power Switch "On"	Printer And Reader/Recorder Motors "On" No Card Light "On"	AC To I/O And Reader/Recorder — OK No Card Light — OK	 Printer A.C. Wiring Diagram
3. Functionally Check Keyboard Operating All Characters And Functions	Printer Responds As Keyboarded	Type In Play — OK Keyboard And Printer — OK Power Supply — OK	Keyboard Function Chart, Wiring Diagram, Static Voltage Check
4. Load A Card With First Card Loaded, Try To Load A Second Card Remove Second Card From Load Slot Attempt To Load Two Cards (One On Top Of Another)	Card Loads, No Card Light "Off" Second Card "Ejects" First Card "Ejects" Cards Will Not Load	Load — OK Two Card Switch — OK Two Card Inhibitor — OK	 Load Function Chart, Wiring Diagram, Reader Recorder Adjustments
5. Load A Card Depress "Track Step Up" For Single And Repeat Operation Depress "Track Step Up" In Track 50 Depress "Track Step Down" For Single And Repeat Operation Depress "Track Step Down" In Track 1	 Track Indicator Responds As Operated Track Step Up Inoperative Track Indicator Responds As Operated Track Step Down Inoperative	 Track Step Up — OK Track 50 Limit — OK Track Step Down — OK Track 1 Limit — OK	 Track Step Function Charts, Wiring Diagram

QUICK CHECK
PERFORM EACH STEP IN SEQUENCE

PROCEDURE	MACHINE RESPONSE	INDICATION	IF MALFUNCTION – GO TO
6. Track Step Up To Track 15 Depress "Eject"	Card Ejects, Track Indicator Returns To Track 1	Eject – OK	Eject Function Chart
7. Playback Functional Test Card Play Some Portions Of The Card In Auto, Line, Word, And Character	Playback Appears As Follows: See Below	Playback – OK Reader – OK	Playback Function Chart, Wiring Diagram, Planar Static Check
8. Depress "Adjust" Playback Functional Test Card	"Adjusted" Playback Appears As Follows: See Below	Adjust – OK Recorder Reverse Drive – OK	Reader Recorder Adjustments, Wiring Diagram

Adjusted Playback

Set margins at 10 and 65. Set tabs at 20, 25, 45, and 55.

```
abcde fghij klmno pqrst uvwxy z]234 56789 0-=!' ;/.,
ABCDE FGHIJ KLMNO PQRST UVWXY Z[@#$ %¢&*( )_+°" :?.,
AaBbC cDdEe FfGgH hIiJj KkL1M mNnOo PpQqR rSsTt UuVv
WwXxY yZz[] @2#3$ 4%5¢6 &7*8( 9)0_- +=°!" ':;?/ ..,,

The quick brown fox jumped over the lazy dogs.

[[      [[   [[                [[      [[
2       22   22                22      22
3       3    33                33      33
4       4    4                 44      44
5       5    5                 5       55

Now is the time for all good men to come to the aid
of their country.
```

Playback

Set margins at 10 and 65. Set tabs at 20, 25, 45, and 55.

```
abcde fghij klmno pqrst
uvwxy z]234 56789 0-=!' ;/.,
ABCDE FGHIJ KLMNO PQRST
UVWXY Z[@#$ %¢&*( )_+°" :?.,
AaBbC cDdEe FfGgH hIiJj
KkL1M mNnOo PpQqR rSsTt UuVv
WwXxY yZz[] @2#3$ 4%5¢6
&7*8( 9)0_- +=°!" ':;?/ ..,,

The quick brown fox jumped over the lazy dogs.

[[      [[   [[                [[      [[
2       22   22                22      22
3       3    33                33      33
4       4    4                 44      44
5       5    5                 5       55

Now is the time for all good men to come to the aid of their country.
```

QUICK CHECK
PERFORM EACH STEP IN SEQUENCE

PROCEDURE	MACHINE RESPONSE	INDICATION	IF MALFUNCTION — GO TO
9. Load Functional Test Card Depress "Skip" Depress "Auto"	No Card Light "On," Card Skips (To Stop Code At End Of First Line), No Printer Action Occurs	Skip — OK	Wiring Diagram, Static Voltage Check
10. Remove Functional Test Card Load "Work" Card Depress "Record" Functionally Check Keyboard, Operating All Characters And Functions Depress "Code" + "1" At End Of Your Recording (Card Repeat Code) Depress "Play" Depress "Auto"	Printer And Reader/Recorder Respond As Keyboarded Track Indicator Returns To Track 1 Printer Plays Back Your Recorded Keyboard Check	Record — OK Recorder — OK Code — OK System — OK	a. Keyboard Function Chart, Wiring Diagram, Static Voltage Check b. Static Voltage Check c. Static Voltage Check, Wiring Diagram

SYSTEM UNIT ISOLATION CHARTS

MC, E/MC

"X" Indicates System Units Used — Modes Used

System Units	Type In Play	Playback	Adjust	Skip	Record
Keyboard	X				X
Printer	X	X	X		X
Reader		X	X	X	X
Recorder			*		X
Power Supply	X	X	X	X	X
Planar Package	X	X	X	X	X

*Reverse Drive Only Used In Adjust

MC/A, MCII, MEM/T, ESC, MCC

"X" Indicates System Units Used — Modes Used

System Units	Type	Playback	Read	Record
Keyboard	X			
Printer	X	X		
Card Deck			X	X
Tape Loop			X	X
Power Supply	X	X	X	X
Planar Package	X	X	X	X

MC, E/MC SYSTEM BUSY CHECK

1. With the "Skip" button latched down, depress and hold the "Code" button. Check to see if the No-Card Light is "On" . . . . . YES — Go to step 2.
   NO:
   A. Operate the keyboard and check to see if the keyboard cycles with no printer response . . . . . YES — Go to step 2.
   B. **If the keyboard does operate the printer, the system is not busy. Use the applicable diagnostic aid to diagnose the malfunction.**

2. Are the I/O and Reader/Recorder motors running? . . . . . YES — Go to step 3.
   NO:
   A. Check the service connector to each motor for good contact.
   B. Check the AC wiring to the motors (AC wiring on I/O and Reader/Recorder wiring diagrams).

3. If a card is in the card path, eject the card (manually, if necessary).

   Turn power switch "Off," then back "On," and check to see if the:
   A. Forward magnet picks momentarily.
   B. "E" and "F" lights are "On."
   C. No-Card light is "On." . . . . . YES — Go to step 4.
   NO:
   A. Check the Power Supply fuses.
   B. If the fuses are OK, check the power supply voltages at connectors (power supply wiring diagram). Also check the "T" connectors for good contact.
   C. If the power supply checks OK, check the power supply input voltages at the planar and Reader/Recorder (Planar Static Voltage Check and Reader/Recorder wiring diagram). . . . . Voltages OK — Go to step 4.
   NO — Check the cable wiring from the power supply to the planar and reader/Recorder.

4. Operate the keyboard to see if the system is still "busy" . . . . . YES — Go to step 5.
   NO:
   A. **Operate the machine (I/O and/or Reader/Recorder) until it becomes "busy" again.**
   B. **Use the applicable function chart to diagnose the malfunction.**

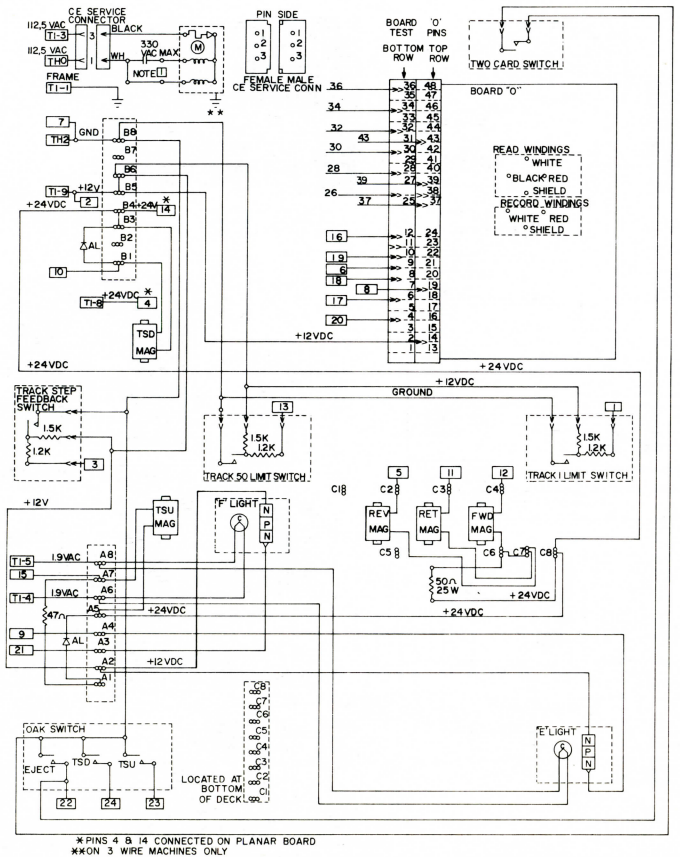
5. Hand cycle a character and check planar (strobe) for a change from a static level of 7.5V to an active level of 0V . . . . . YES — Go to step 6.
   NO — Check the keyboard transmit board and cabling.

6. Check planar (PR-OP-S Feedback) for a static level of 7.5V . . . . . YES — Go to step 7.
   NO — Check the printer feedback circuit (I/O wiring diagram).

7. Check planar (track step feedback) for a static level of 0V . . . . . YES — Go to step 8.
   NO — Check the track step feedback circuit (Reader/Recorder wiring diagram).

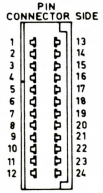
8. Perform a complete Planar Static Voltage Check . . . . . Voltages OK — Go to step 9.
   NO:
   A. **Check the related machine function for voltage differences.**
   B. Check the planar connectors for good contact.
   C. Replace the planar.

9. Check the system ground wiring (I/O, Reader/Recorder, and Power supply wiring diagrams).
   Ground wiring OK . . . . . Replace Planar.



PIN ASSIGNMENT

PIN	NAME	PIN	NAME
1	TK1 Limit Sw.	13	TK50 Limit Sw.
2	+12 VDC T1-9	14	+24 VDC B-4
3	TK Step FB	15	TSU Mag.
4	+24 V — T1-8	16	Bd. 'O' Pin 12
5	Rev. Mag.	17	Bd. 'O' Pin 6
6	Bd. 'O' Pin 9	18	Bd. 'O' Pin 8
7	T1-12 Grd.	19	Bd. 'O' Pin 10
8	Bd. 'O' Pin 19	20	Bd. 'O' Pin 4
9	'E' Light A-4	21	'F' Light A-3
10	TSD Mag.	22	Eject Kb.
11	Ret. Mag.	23	TSU Kb.
12	Fwd. Mag.	24	TSD Kb.



R/R T1 CONNECTOR

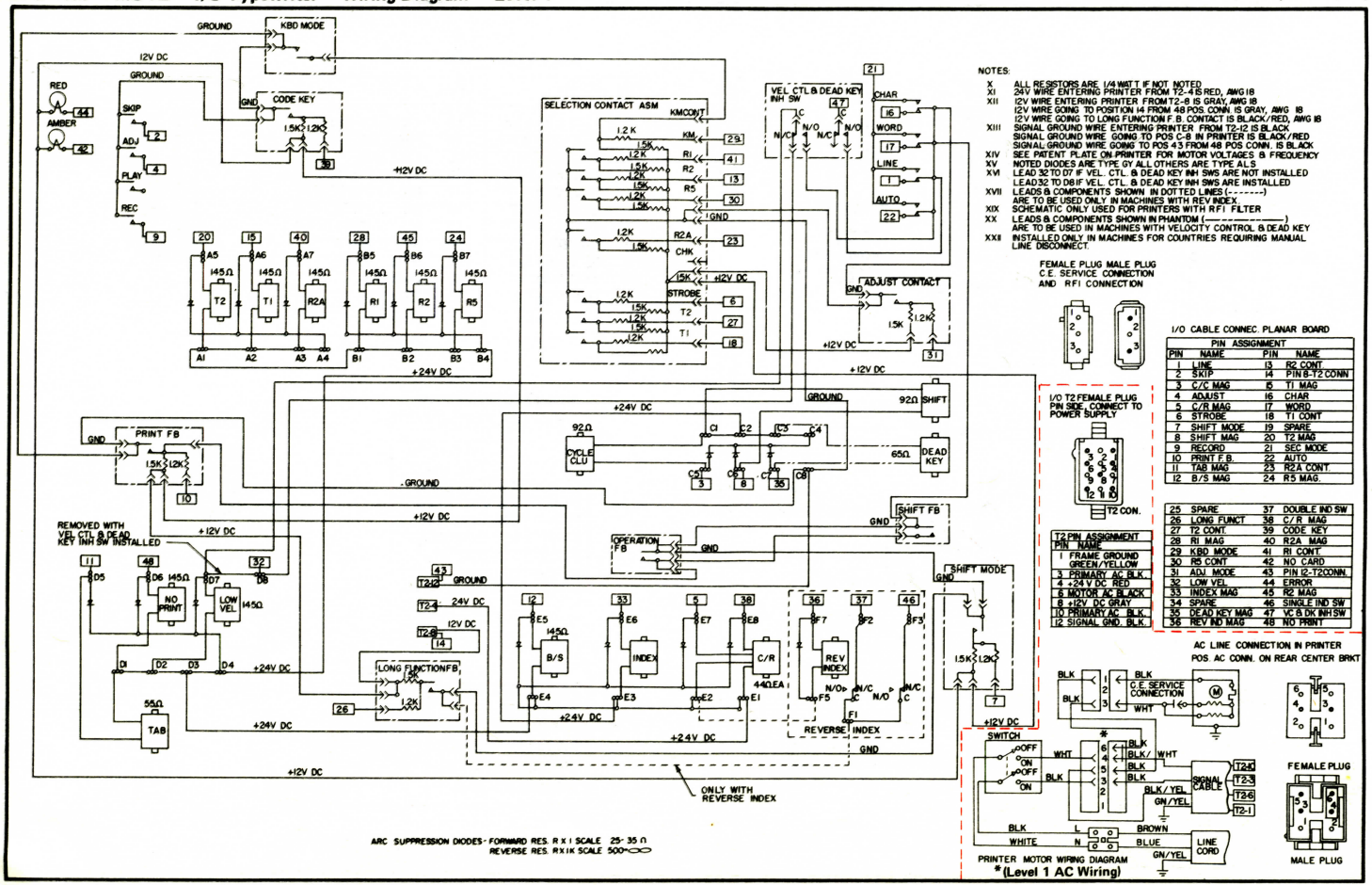
PIN ASSIGNMENT	
T1-1	Ground Gr./Yel.
T1-3	115 VAC Black
T1-4	1.9 VAC Black
T1-5	1.9 VAC Black
T1-8	+24 VDC Red
T1-9	+12 VDC Gray
T1-10	115 VAC Black
T1-12	Ground

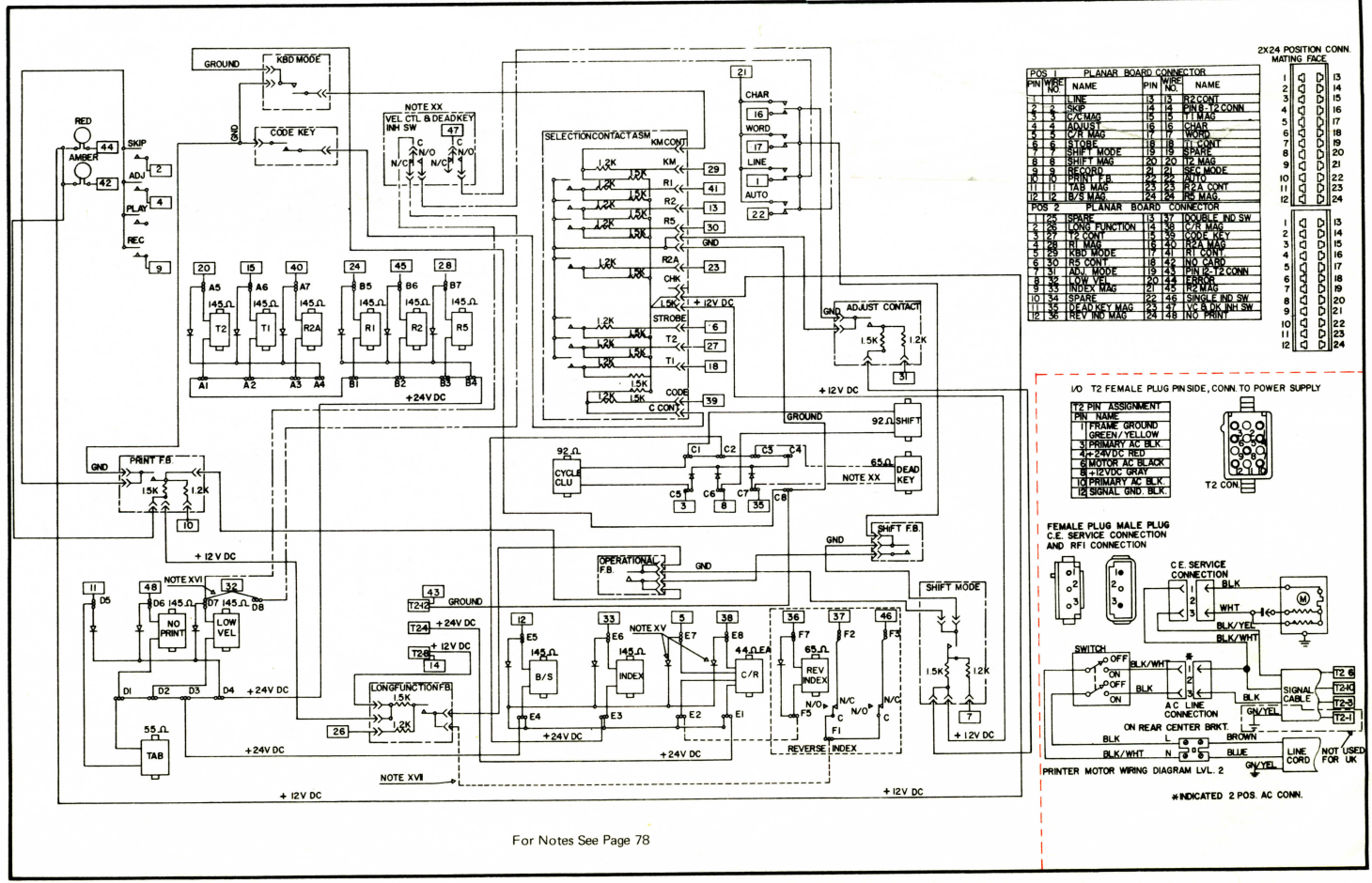


R/R T1 CONNECTOR AT POWER SUPPLY PIN SIDE MALE PLUG

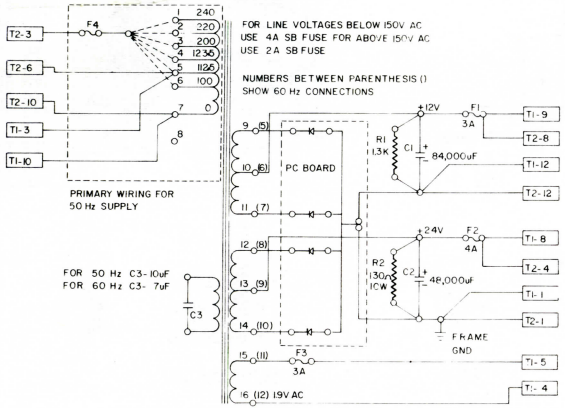
COLOR CODE

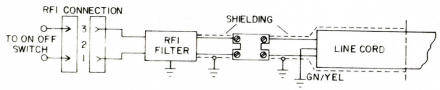
+24 V DC	RED
+12 V DC	GRAY
1.9V AC	BLACK
PRIMARY WIRING	BLACK
SIGNAL GROUND	BLACK
FRAME GOUND	GN-YEL

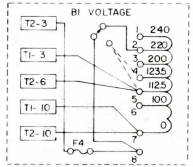

GROUND
KBD MODE
12V DC
GROUND
RED
AMBER
SKIP
ADJ
PLAY
REC
CODE KEY
+12V DC
SELECTION CONTACT ASM
KMCONT
VEL CTL & DEAD KEY INH SW
CHAR
WORD
LINE
AUTO
ADJ/ST CONTACT
STROBE
CHK
+24V DC
+12V DC
GROUND
92Ω SHIFT
65Ω DEAD KEY
92Ω CYCLE CLU
PRINT FB
.GROUND
REMOVED WITH VEL CTL & DEAD KEY INH SW INSTALLED
NO PRINT
LOW VEL
SHIFT FB
OPERATION FB
SHIFT MODE
LONG FUNCTION FB
B/S
INDEX
C/R
REV INDEX
TAB
55Ω
ONLY WITH REVERSE INDEX
ARC SUPPRESSION DIODES- FORWARD RES. R X 1 SCALE 25-35 Ω
REVERSE RES. R X 1K SCALE 500+
NOTES:
X ALL RESISTORS ARE 1/4 WATT IF NOT NOTED
XI 24V WIRE ENTERING PRINTER FROM T2-4 IS RED, AWG 18
XII 12V WIRE ENTERING PRINTER FROM T2-8 IS GRAY, AWG 18
12V WIRE GOING TO POSITION 14 FROM 48 POS. CONN. IS GRAY, AWG 18
12V WIRE GOING TO LONG FUNCTION F.B. CONTACT IS BLACK/RED, AWG 18
XIII SIGNAL GROUND WIRE ENTERING PRINTER FROM T2-12 IS BLACK
SIGNAL GROUND WIRE GOING TO POS C-8 IN PRINTER IS BLACK/RED
SIGNAL GROUND WIRE GOING TO POS 43 FROM 48 POS CONN. IS BLACK
XIV SEE PATENT PLATE ON PRINTER FOR MOTOR VOLTAGES & FREQUENCY
XV NOTED DIODES ARE TYPE GY ALL OTHERS ARE TYPE ALS
XVI LEAD 32 TO D7 IF VEL. CTL. & DEAD KEY INH SWS ARE NOT INSTALLED
LEAD 32 TO D8 IF VEL. CTL. & DEAD KEY INH SWS ARE INSTALLED
XVII LEADS & COMPONENTS SHOWN IN DOTTED LINES (- - - - - -)
ARE TO BE USED ONLY IN MACHINES WITH REV INDEX.
XIX SCHEMATIC ONLY USED FOR PRINTERS WITH RFI FILTER
XX LEADS & COMPONENTS SHOWN IN PHANTOM (— — — — — —)
ARE TO BE USED IN MACHINES WITH VELOCITY CONTROL & DEAD KEY
XXII INSTALLED ONLY IN MACHINES FOR COUNTRIES REQUIRING MANUAL LINE DISCONNECT.
FEMALE PLUG MALE PLUG
C.E. SERVICE CONNECTION
AND RFI CONNECTION
I/O T2 FEMALE PLUG PIN SIDE, CONNECT TO POWER SUPPLY
T2 CON.
T2 PIN ASSIGNMENT
PIN NAME
1 FRAME GROUND GREEN/YELLOW
3 PRIMARY AC BLK
4 +24 V DC RED
6 MOTOR AC BLACK
8 +12V DC GRAY
10 PRIMARY AC BLK.
12 SIGNAL GND. BLK.
I/O CABLE CONNEC. PLANAR BOARD
PIN ASSIGNMENT
PIN NAME PIN NAME
1 LINE 13 R2 CONT
2 SKIP 14 PIN 8-T2 CONN
3 C/C MAG 15 T1 MAG
4 ADJUST 16 CHAR
5 C/R MAG 17 WORD
6 STROBE 18 T1 CONT
7 SHIFT MODE 19 SPARE
8 SHIFT MAG 20 T2 MAG
9 RECORD 21 SEC MODE
10 PRINT F.B. 22 AUTO
11 TAB MAG 23 R2A CONT
12 B/S MAG 24 R5 MAG
25 SPARE 37 DOUBLE IND SW
26 LONG FUNCT 38 C/R MAG
27 T2 CONT. 39 CODE KEY
28 R1 MAG 40 R2A MAG
29 KBD MODE 41 R1 CONT
30 R5 CONT 42 NO CARD
31 ADJ. MODE 43 PIN 12-T2 CONN
32 LOW VEL 44 ERROR
33 INDEX MAG 45 R2 MAG
34 SPARE 46 SINGLE IND SW
35 DEAD KEY MAG 47 VC & DK INH SW
36 REV IND MAG 48 NO PRINT
AC LINE CONNECTION IN PRINTER
POS. AC CONN. ON REAR CENTER BRKT
C.E. SERVICE CONNECTION
SWITCH
SIGNAL CABLE
LINE CORD
BROWN
BLUE
FEMALE PLUG
MALE PLUG
PRINTER MOTOR WIRING DIAGRAM
*(Level 1 AC Wiring)



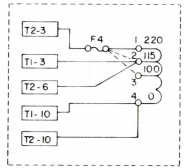
For Notes See Page 78







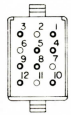
PRIMARY WIRING FOR 50Hz
BI-VOLTAGE SUPPLY



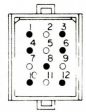
PRIMARY WIRING FOR 60Hz
SUPPLY

COLOR CODE	
+ 24 V DC	RED
+ 12 V DC	GRAY
1.9 V AC	BLACK
PRIMARY WIRING	BLACK
SIGNAL GROUND	BLACK
FRAME GROUND	GN/YEL

PIN ASSIGNMENT		
NAME	T1	T2
FRAME GROUND GREEN YELLOW	1	1
PRIMARY AC BLACK	10	10
PRIMARY AC BLACK	—	3
MOTOR AC BLACK	3	6
1.9V AC BLACK	4	
1.9V AC BLACK	5	
+24 V DC RED	8	4
+12 V DC GRAY	9	8
SIGNAL GROUND BLACK	12	12



T1 CONNECTION
READER FEMALE
PLUG



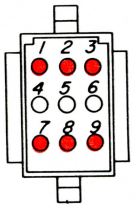
T2 CONNECTION
PRINTER MALE
PLUG

E/MC STATIC VOLTAGE CHECK

1. All voltages are ±20% except supply *voltages (±10%) with meter on 30 VDC scale, the system in skip, magnetic head in Track 1, no card loaded, printer and keyboard in lower case, all tabs cleared, leadscrew at "home," space expand up, reverse index machines with index lever in 1-1/2 position, and end of ribbon sensor held down.

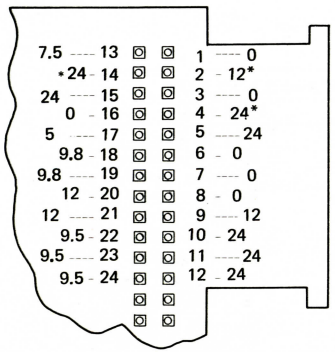
PIN	NAME
1	0V Rev. Ind. Single Sw.
2	0V Rev. Ind. Double Sw.
3	24V Rev. Index Mag.
4	
5	
6	
7	24V Dead Key Mag.
8	9V Multi 1 Cont.
9	9V Multi 2 Cont.

Note: All Readings Are 0V
Unless Feature Is Installed

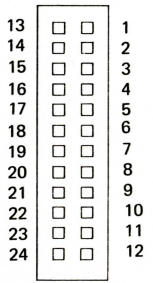


Printer
T4 — Pin Side

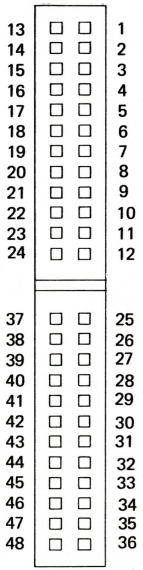
READER/RECORDER



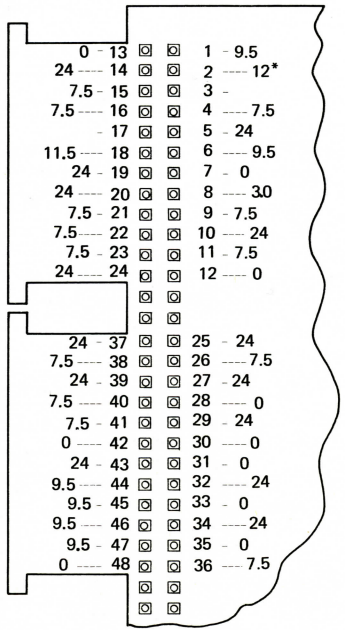
Wiring Side

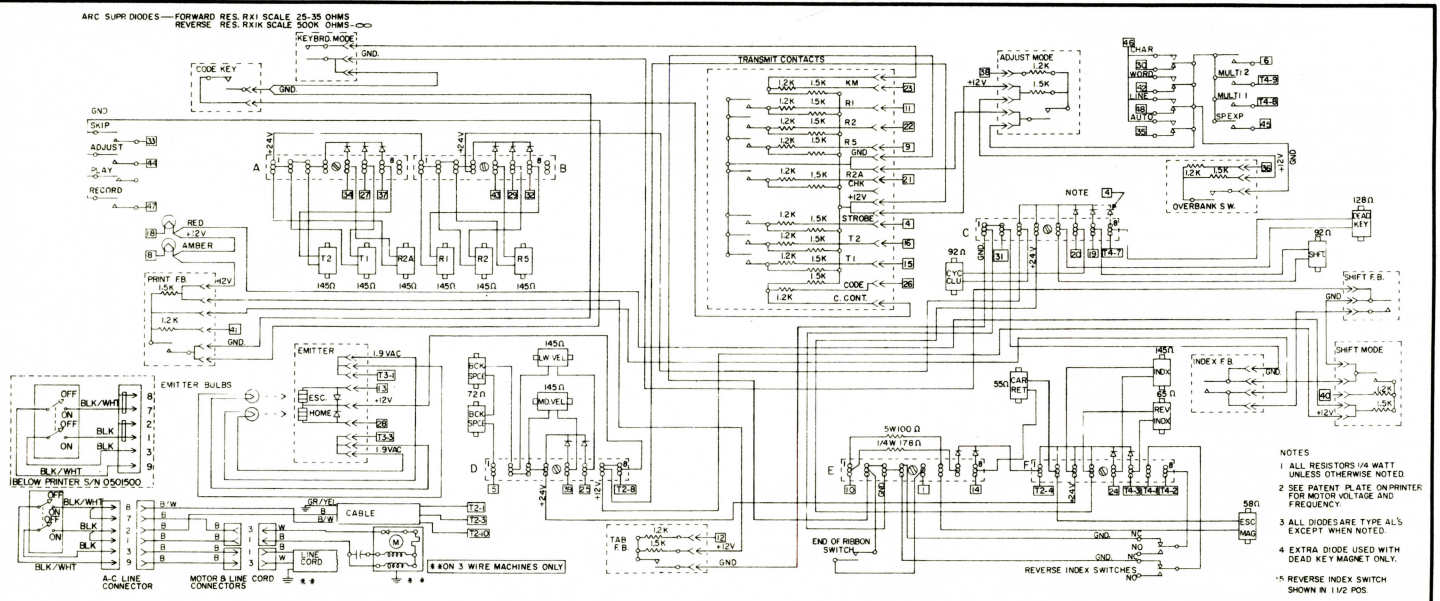


Wiring Side



PRINTER



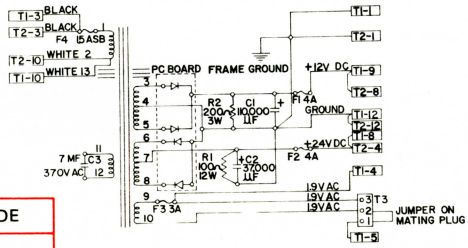


NOTES

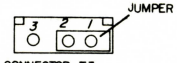
1. ALL RESISTORS 1/4 WATT UNLESS OTHERWISE NOTED.
2. SEE PATENT PLATE ON PRINTER FOR MOTOR VOLTAGE AND FREQUENCY.
3. ALL DIODES ARE TYPE ALS EXCEPT WHEN NOTED.
4. EXTRA DIODE USED WITH DEAD KEY MAGNET ONLY.
5. REVERSE INDEX SWITCH SHOWN IN 1 1/2 POS.

POS. 1 PLANAR BOARD CONNECTOR			
PIN	NAME	PIN	NAME
1	End Of Ribbon	13	Emitter (Esc.)
2	+12V (To T2-8)	14	Carrier Return
3		15	T1 Contact
4	Strobe	16	T2 Contact
5	Backspace	17	
6		18	Error Light
7	Gnd (Spare)	19	Shift Magnet
8	No Card Light	20	Cycle Clutch
9	R5 Contact	21	R2A Contact
10	Escape. Mag.	22	R2 Contact
11	R1 Contact	23	Keybd. Mode
12	Tab FB	24	Index Magnet

POS. 2 PLANAR BOARD CONNECTOR			
PIN	NAME	PIN	NAME
25	Low Vel. Mag.	37	T2 Magnet
26	Code Contact	38	Adjust Mode
27	T1 Magnet	39	Med. Vel. Mag.
28	Emitter (Home)	40	Shift Mode
29	R2 Magnet	41	P/O/S FB
30	Char. Contact	42	Word Contact
31	Ground (T2-12)	43	R5 Magnet
32	R1 Magnet	44	Adjust Contact
33	Skip Contact	45	Space Expand
34	R2A Magnet	46	Sec. Mode
35	Auto Contact	47	Record Cont.
36	Overbank	48	Line Cont.



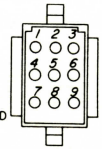
COLOR CODE
+24 VDC — Red
+12 VDC — Gray
Ground — Black
1.9 VAC — Black



CONNECTOR T3
PRINTER
MALE PLUG 1.9 VAC



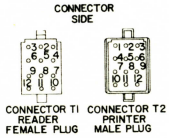
CONNECTOR T3
PRINTER
FEMALE PLUG 19VAC



CONNECTOR T4
PRINTER
FEMALE PLUG
FEATURE BOARD

POWER SUPPLY

PIN ASSIGNMENT		
Name	T1	T2
Frame Ground Green/Yellow	1	1
AC Black	3	3
1.9 VAC Black	4	
1.9 VAC Black	5	
+24 V Red	8	4
+12 V Gray	9	8
AC White	10	10
Ground Black	12	12



CONNECTOR T1
READER
FEMALE PLUG

CONNECTOR T2
PRINTER
MALE PLUG

FEATURE BOARD CONN. I/O T4	
PIN	NAME
1	Rev. Ind. Single Sw.
2	Rev. Ind. Double Sw.
3	Rev. Index Mag.
4	
5	
6	
7	Dead Key Mag.
8	Multilingual 1 Cont.
9	Multilingual 2 Cont.

1.9 VAC CONN. I/O T3	
PIN	NAME
1	1.9 VAC Blue
2	
3	1.9 VAC Blue

I/O T2 CONN. POWER SUPPLY	
PIN	NAME
1	Frame Ground Green/Yellow
2	
3	AC Black
4	+24V Red
5	
6	
7	
8	+12V Gray
9	
10	AC Black/White
11	
12	Gnd. Black

BOARD "0" AND MAGNETIC HEAD TEST PROCEDURE

INPUTS

1. With the machine in play and no card loaded, unplug board zero from its connector and check for the following input voltages.

   a. 12 VDC between pin 14 and ground. Input from the power supply.

   b. 12 VDC between pins 4, 6, 8, 10 and ground. Input from the Planar Package.

   c. Ground on pins 9 and 19. Input from the Planar Package.

   d. 1.6 VDC between pin 12 and ground. Input from the Planar Package.

   e. Check the pins in the board zero connector for damage.

STATIC READINGS

2. With board zero plugged back in, the machine in play and no card loaded, if any of the following voltage levels read incorrectly, board zero is defective and should be replaced.

   a. 7.5 to 9.5 VDC between pin 36 and ground.

   b. 0 ± .1 VDC between pin 34 and 36.

   c. 2 to 12 VDC between pin 39 and ground.

   d. 0 to .2 VDC between pin 37 and ground.

   e. 2 to 12 VDC between pin 26 and ground.

   f. 2 to 12 VDC between 32 and ground.

RESISTANCE READINGS

3. With the read and record head unplugged if the resistance readings read incorrectly the magnetic head should be replaced.

READ HEAD

   a. R x 1K scale – No continuity between the "shield" lead and any of the other leads.

   b. R x 10 scale – 168 ohms, ±10%, between the red and black leads.

   c. R x 10 scale – 78 ohms, ±10%, between the red and white leads.

RECORD HEAD

   a. R x 1K scale – No continuity between the "shield" lead and any of the other leads.

   b. R x 1 scale – 4 to 5 ohms between the red and white leads.

DYNAMIC READINGS

4. With the machine in play and no card loaded if any of the following voltage levels read incorrectly board zero is defective and should be replaced.

   a. 0 to .5 VDC between pin 28 and ground with pin 26 grounded.

   b. 0 to .5 VDC between pin 30 and ground with pin 32 grounded.

   c. With the alignment card loaded and the machine in the alignment mode, check the AC signal level between pins 34 and 36. Check in tracks 1, 25 and 50. **If the head is in correct contact with the card,** the readings should be the same as those recorded on the machine history card plus or minus 10%.

   d. With the alignment card loaded and the machine in the alignment mode,* check for 3 to 8 VAC between pin 12 and ground.

*After a card is loaded, put machine in the alignment mode by latching down both the skip and adjust buttons and depressing one of the secondary mode buttons auto, line, word, char/stop.

HEAD ALIGNMENT PROCEDURE

1. When the head is first installed in the machine, the pitch adjusting screw should be centered in its range, then the head mounting screws loosened and the head pushed down flat against the magnetic card, and the set screw tightened. This gives a preliminary pitch alignment which should be close enough to allow the head output to be read and adjusted.

2. Set the meter to the 12 VAC scale and connect the meter leads to test pins 34 and 36 on the board 0 plug.

3. With the machine in play, adjust, or skip, load the alignment card into the machine and put the machine in the alignment mode.*

4. (PRELIMINARY) With the head in any track between 7 and 40, adjust head roll and pitch for maximum signal.

5. (PRELIMINARY) Move the head to track 3 and adjust the head across the card for maximum signal.

6. Move the head to track 5 and using the screwdriver slot adjust the head skew for maximum signal.

7. Check the head signal in tracks 1, 25, and 50 and adjust the head roll for minimum signal differences between tracks.

8. Move the head to track 25 and adjust pitch in the center of its range by first turning the screw one direction until the signal begins to fade and then the other direction until the signal begins to fade and then centering the adjustment.

9. Move the head to track 3 and carefully readjust the head across the card for maximum signal.

10. Remove the alignment card.

11. Take a magnet and erase all recorded information from an extra card. Put the machine in record and load this card into the machine.

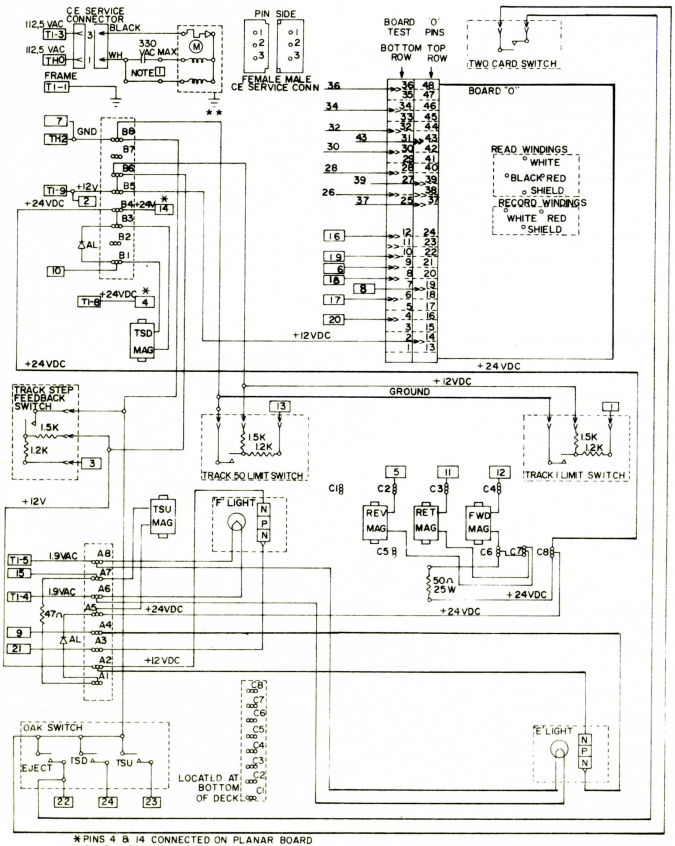
12. Slowly track step up to track 50 to record a dummy character in every track and then eject the card.

13. Develop the card and check the dummy bits for correct front to rear position on the card, by using the template supplied.

14. If the dummy bit position is incorrect loosen the small bristol screw in the side of the head carrier and adjust the large bristol screw in the front to correct the position.

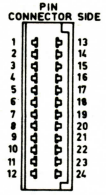
NOTE: Erase previous recorded dummy character.

*After a card is loaded, put machine in the alignment mode by latching down both the skip and adjust buttons and depressing one of the secondary mode buttons auto, line, word, char/stop.

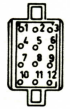


PIN ASSIGNMENT				
PIN	NAME		PIN	NAME
1	TK1 Limit Sw.		13	TK50 Limit Sw.
2	+12 VDC T1-9		14	+24 VDC B-4
3	TK Step FB		15	TSU Mag.
4	+24 V — T1-8		16	Bd. '0' Pin 12
5	Rev. Mag.		17	Bd. '0' Pin 6
6	Bd. '0' Pin 9		18	Bd. '0' Pin 8
7	T1-12 Grd.		19	Bd. '0' Pin 10
8	Bd. '0' Pin 19		20	Bd. '0' Pin 4
9	'E' Light A-4		21	'F' Light A-3
10	TSD Mag.		22	Eject Kb.
11	Ret. Mag.		23	TSU Kb.
12	Fwd. Mag.		24	TSD Kb.

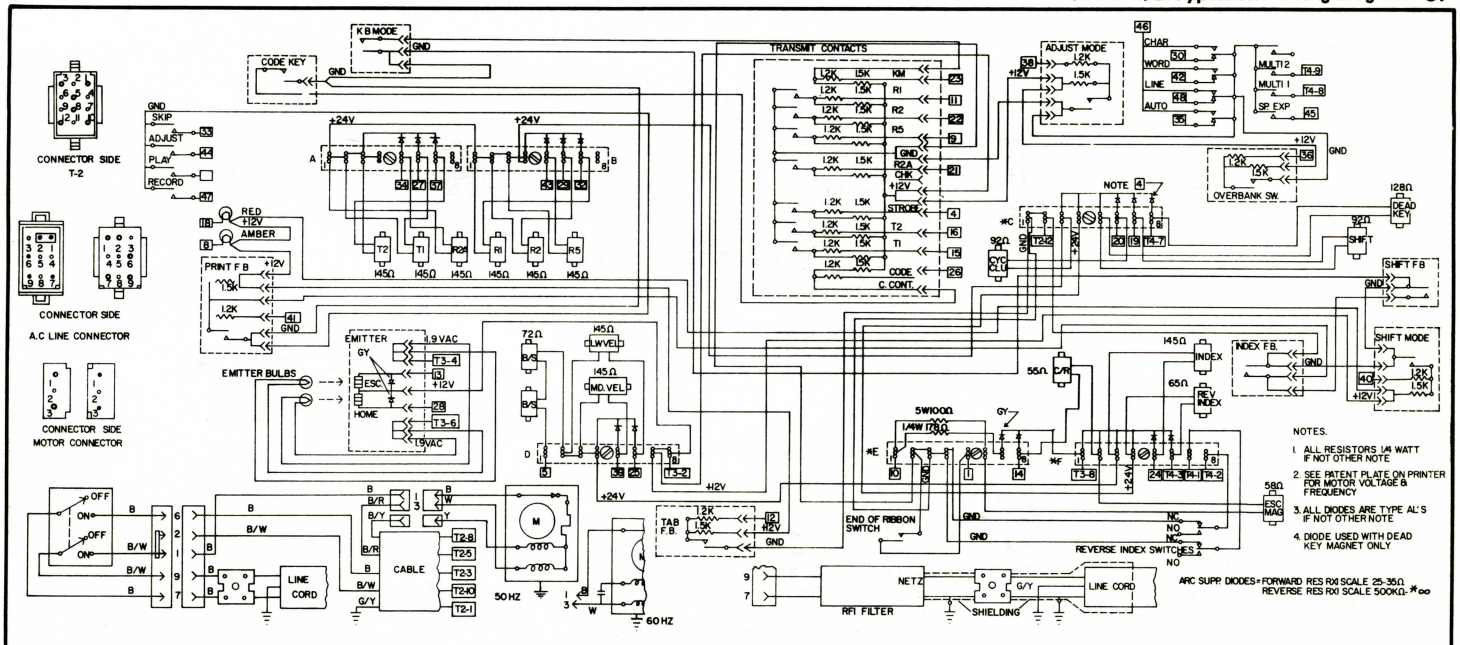
PIN CONNECTOR SIDE



R/R T1 CONNECTOR PIN ASSIGNMENT	
T1-1	Ground Gr./Yel.
T1-3	115 VAC Black
T1-4	1.9 VAC Black
T1-5	1.9 VAC Black
T1-8	+24 VDC Red
T1-9	+12 VDC Gray
T1-10	115 VAC Black
T1-12	Ground

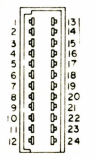


COLOR CODE
+24 VDC — Red
+12 VDC — Gray
1.9 VAC — Black
Primary Wiring — Black
Signal Ground — Black
Frame Ground — Green/Yellow

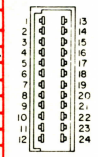


POS. 1 PLANAR BOARD CONNECTOR					
PIN	WIRE NO.	NAME	PIN	WIRE NO.	NAME
1	1	End Of Ribbon	13	13	Emitter (Esc.)
2	2	+12 (To T3 P2)	14	14	Carrier Ret.
3	3		15	15	T1 Contact
4	4	Strobe	16	16	T2 Contact
5	5	Backspace	17	17	
6	6	Cond. (N-1)	18	18	Error Light
7	7	Gnd. (Spare)	19	19	Shift Mag.
8	8	No Card Light	20	20	Cycle Clutch
9	9	R5 Contact	21	21	R2A Contact
10	10	LSF Magnet	22	22	R2 Contact
11	11	R1 Contact	23	23	Keybd. Mode
12	12	Rotary Tab	24	24	Index Mag.

2 x 24 POSITION CONNECTOR SIDE



POS. 2 PLANAR BOARD CONNECTOR					
PIN	WIRE NO.	NAME	PIN	WIRE NO.	NAME
1	25	Low Vel. Mag.	13	37	T2 Magnet
2	26	Code Contact	14	38	Adjust Mode
3	27	T1 Magnet	15	39	Med. Vel. Mag.
4	28	Emitter (Home)	16	40	Shift Mode
5	29	R2 Magnet	17	41	Print FB
6	30	Char. Contact	18	42	Word Contact
7	31	Gnd.(To T2P12)	19	43	R5 Magnet
8	32	R1 Magnet	20	44	Adjust Cont.
9	33	Skip Contact	21	45	Space Expand
10	34	R2A Magnet	22	46	Sec Mode
11	35	Auto Cont.	23	47	Record Cont.
12	36	Margin Cont.	24	48	Line Cont.

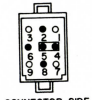


T2 POWER SUPPLY CONN.		
PIN	WIRE NO.	NAME
1	55	Frame Ground Green/Yellow
3	56	AC Black
5	63	AC Black/Red
8	64	50Hz Motor Star Yel.
10	61	AC Black/White
12	3 &62	Gnd. Black

T3 POWER SUPPLY CONN.		
PIN	WIRE NO.	NAME
1		
2	2&60	+12V Gray
3		
4	58	1.9 VAC Blue
5		Jumper Terminal
6	59	1.9 VAC Blue
7		
8	57	+24V Red
9		

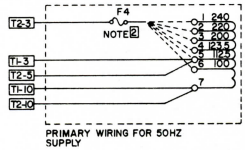
FEATURE BOARD CONN.		
PIN	WIRE NO.	NAME
1	49	Rev. Ind. Single Conn.
2	50	Rev. Ind. Double Conn.
3	51	Rev. Index Mag.
4		
5		
6		
7	52	Dead Key Mag.
8	53	Multilingual 1 Cont.
9	54	Multilingual 2 Cont.

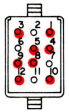
COLOR CODE
+24 VDC — Red
+12 VDC — Gray
1.9 VAC — Black
Primary Wiring — Black
Signal Ground — Black
Frame Ground — Green/Yellow



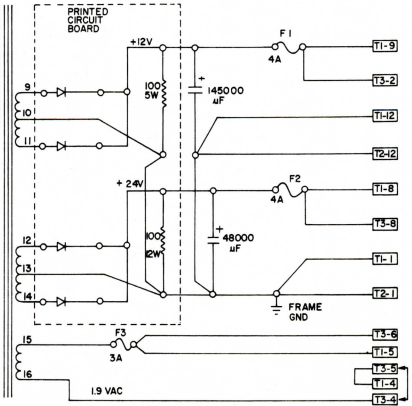
PS T1 — FEMALE PLUG — PIN SIDE, CONN TO R/R

T1 PIN ASSIGNMENT	
PIN	NAME
1	Frame Ground Green/Yellow
3	Motor AC Black
4	1.94 VAC Black Via T3-5
5	1.9 VAC Black
8	+24 VDC Red
9	+12 VDC Gray
10	Motor AC Black
12	Signal Ground Blk.





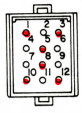




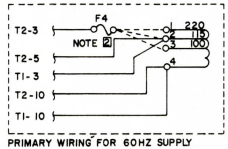
PS T2 — MALE PLUG — PIN SIDE, CONN TO I/O

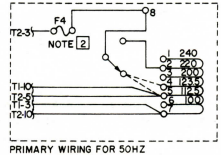


T2 PIN ASSIGNMENT	
PIN	NAME
1	Frame Ground Green/Yellow
3	Primary AC Black
5	Motor Black
8	Motor Start Blk. (50 Hz Mach. Only)
10	Primary AC Black
12	Signal Ground Black



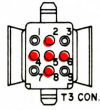
2 FOR LINE VOLTAGE BELOW 150 VAC USE 4ASB FUSE
FOR LINE VOLTAGE ABOVE 150 VAC USE 2ASB FUSE

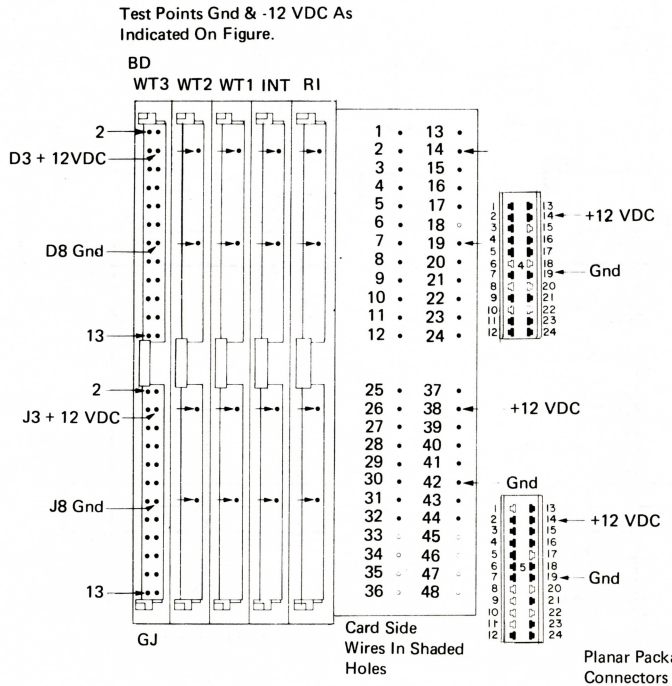




PS T3 — FEMALE PLUG — PIN SIDE, CONN TO I/O

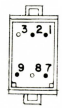
T3 PIN ASSIGNMENT	
PIN	NAME
2	+12 VDC Gray
4	1.9 VAC Black
5	1.9 VAC Black To T1-4 Via T3-4
6	1.9 VAC Black
8	+24 VDC Red





Common Feature Board Position	Feature Board Connector Position
4	1
5	2
6	3
7	4
8	5
9	7
10	9
11	11
12	12
16	13
17	14
19	19
20	16
21	17
22	21
23	23
24	24
25	2
26	3
27	4
28	5
29	6
30	7
31	23
32	12
37	13
38	14
39	15
40	16
41	18
42	19
43	21
44	24

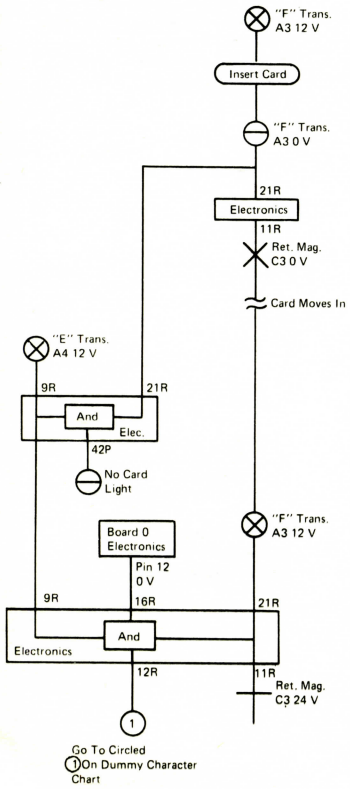
Common Feature Board Position	Planar Package Connector Position
1	3
2	1
3	2
13	7
14	9
15	8



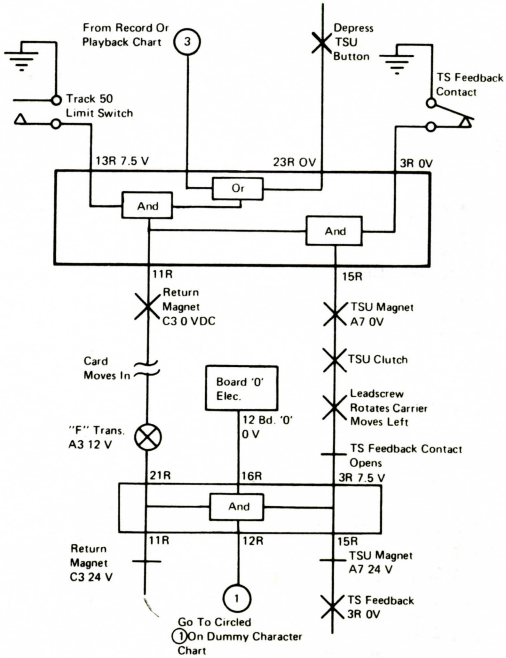
Feature Board Connector — Pin Side Pins In Shaded Holes

When Disconnecting Connectors 4 & 5 From Planar Board, E/MC Must Perform Escapement & Velocity Values As Shown In Diagnostics Character Chart E/MC. If Not, Failure Is Not Caused By E/MC Feature Cable Assembly &/Or Boards.

LOAD

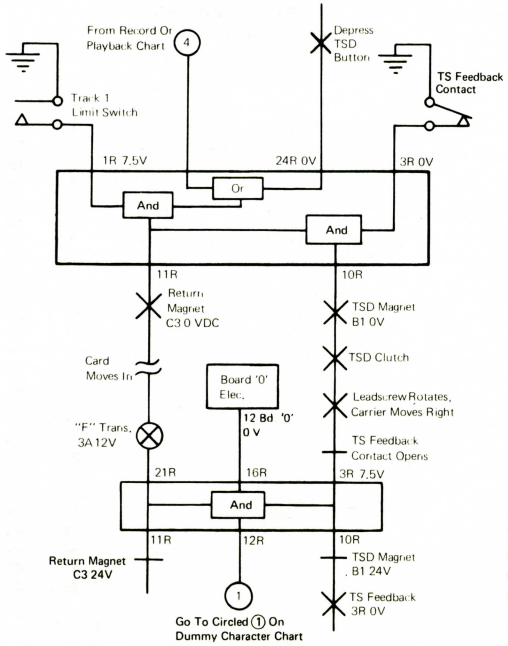


TRACK STEP UP



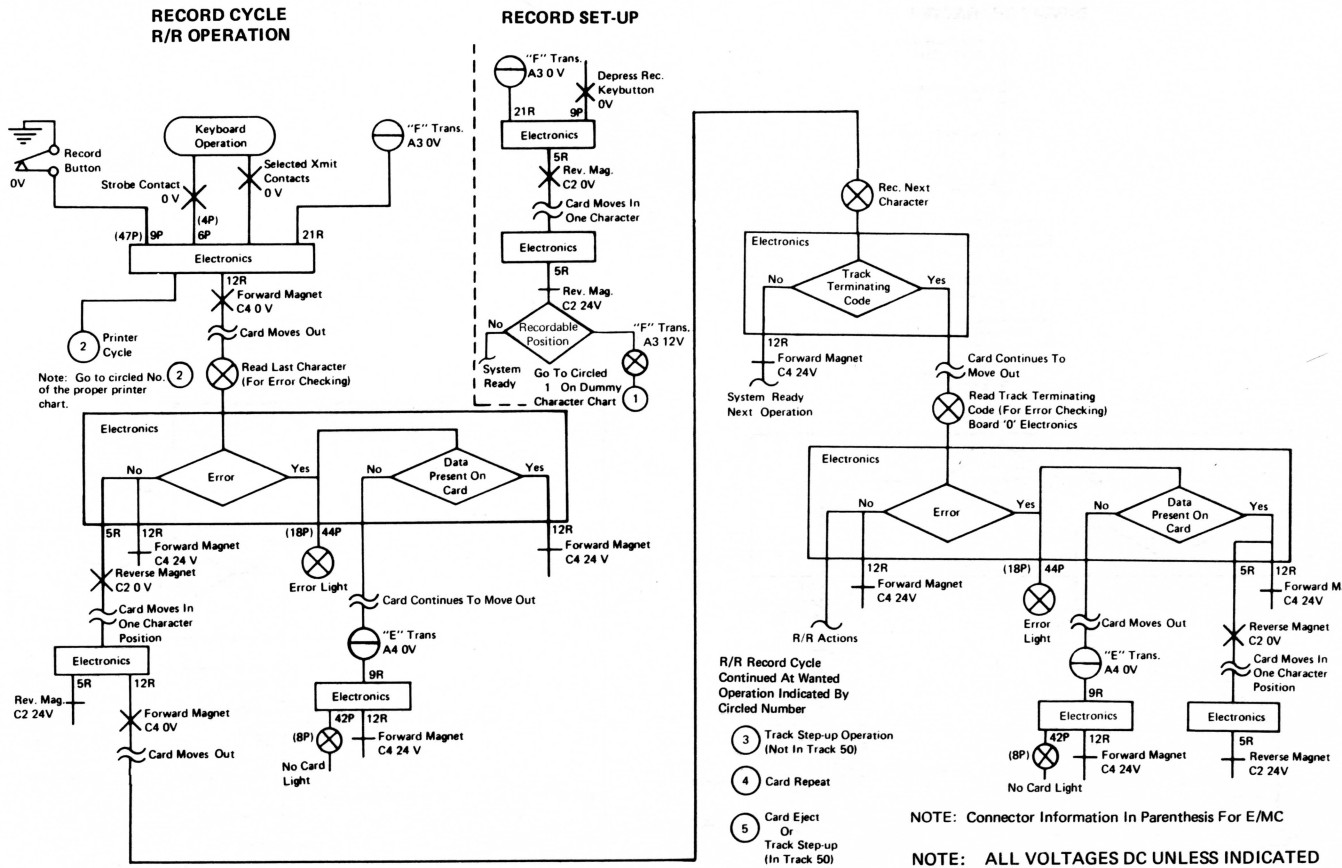
Note: If TSU Button is held down for repeat operation, dummy cycle will occur on 1st and last cycles only.

TRACK STEP DOWN

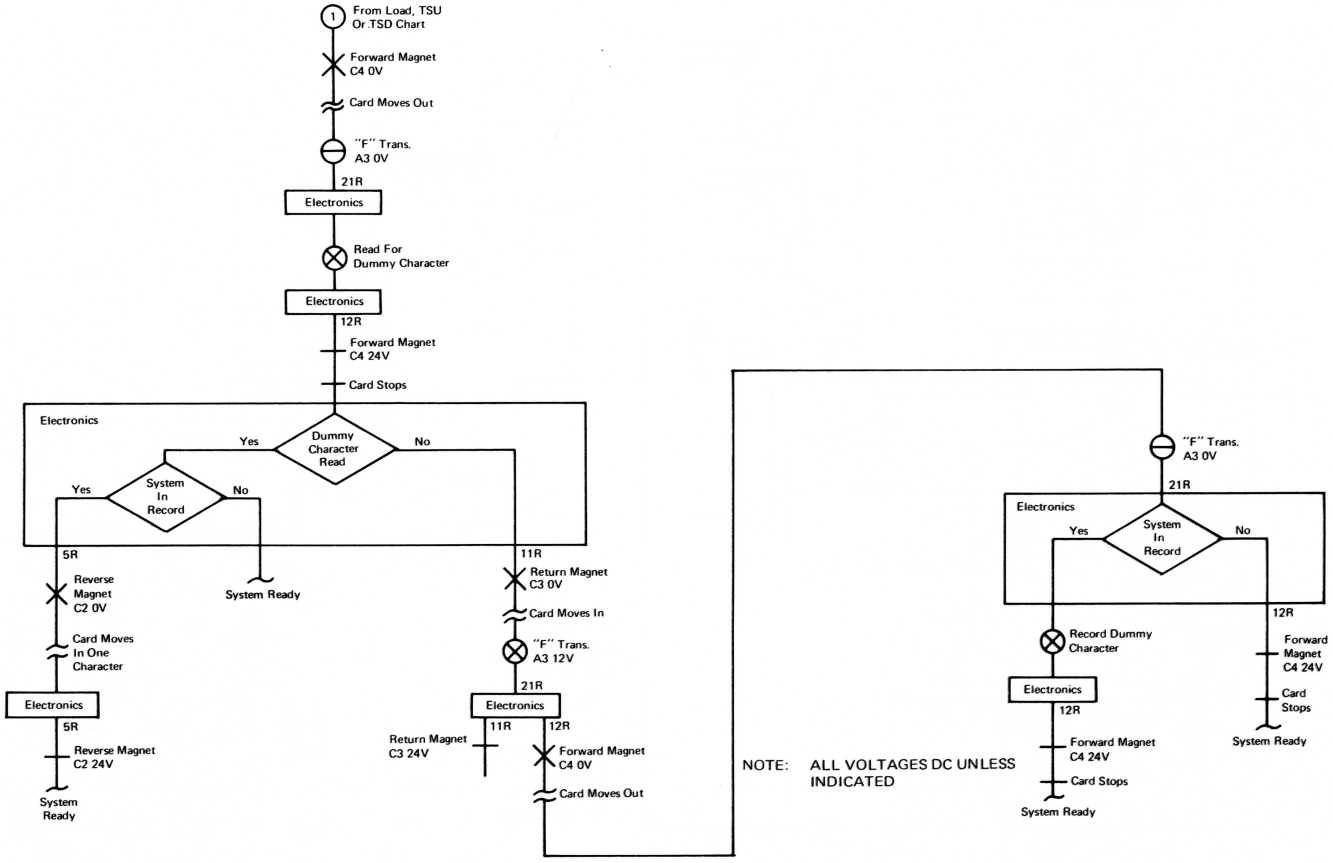


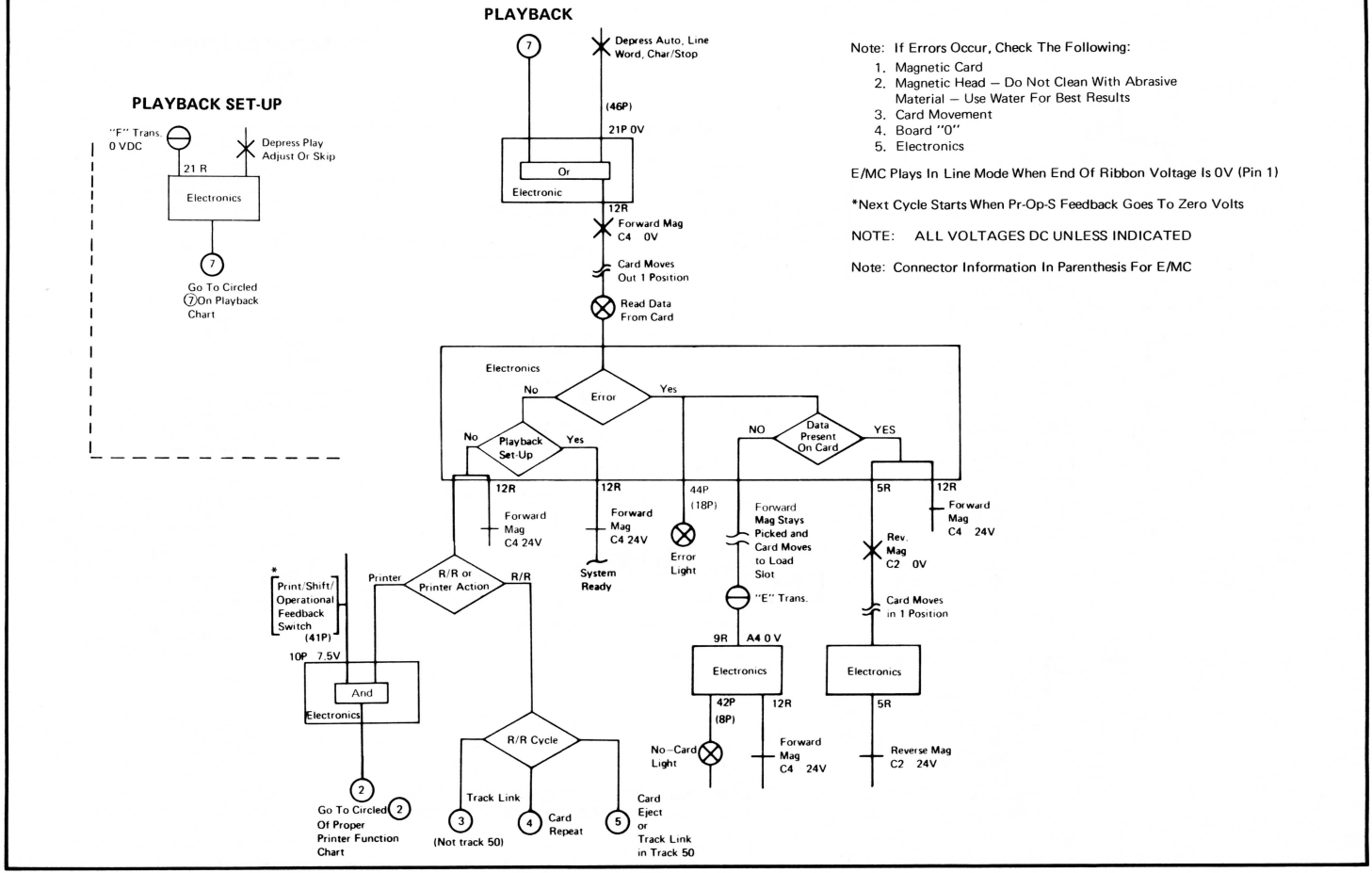
Note: Dummy Cycle Will Occur When TSD Button Is Released Or Track 1 Limit Switch Closes

NOTE: ALL VOLTAGES DC UNLESS INDICATED.


RECORD CYCLE
R/R OPERATION
RECORD SET-UP
Keyboard Operation
Record Button
0V
Strobe Contact 0 V
Selected Xmit Contacts 0 V
"F" Trans. A3 0V
(47P) 9P
(4P) 6P
21R
Electronics
12R
Forward Magnet C4 0 V
Card Moves Out
2 Printer Cycle
Read Last Character (For Error Checking)
Note: Go to circled No. 2 of the proper printer chart.
Electronics
No
Error
Yes
No
Data Present On Card
Yes
5R
12R
Forward Magnet C4 24 V
Reverse Magnet C2 0 V
Card Moves In One Character Position
Electronics
5R
12R
Rev. Mag. C2 24V
Forward Magnet C4 0V
Card Moves Out
(18P) 44P
Error Light
Card Continues To Move Out
"E" Trans A4 0V
9R
Electronics
42P
12R
(8P)
Forward Magnet C4 24 V
No Card Light
12R
Forward Magnet C4 24 V
"F" Trans. A3 0 V
Depress Rec. Keybutton 0V
21R
9P
Electronics
5R
Rev. Mag. C2 0V
Card Moves In One Character
Electronics
5R
Rev. Mag. C2 24V
No
Recordable Position
"F" Trans. A3 12V
System Ready
Go To Circled 1 On Dummy Character Chart
1
Rec. Next Character
Electronics
No
Track Terminating Code
Yes
12R
Forward Magnet C4 24V
System Ready Next Operation
Card Continues To Move Out
Read Track Terminating Code (For Error Checking) Board '0' Electronics
Electronics
No
Error
Yes
No
Data Present On Card
Yes
R/R Actions
12R
Forward Magnet C4 24V
(18P) 44P
Error Light
Card Moves Out
"E" Trans. A4 0V
9R
Electronics
42P
12R
(8P)
Forward Magnet C4 24V
No Card Light
5R
12R
Forward Magnet C4 24V
Reverse Magnet C2 0V
Card Moves In One Character Position
Electronics
5R
Reverse Magnet C2 24V
R/R Record Cycle Continued At Wanted Operation Indicated By Circled Number
3 Track Step-up Operation (Not In Track 50)
4 Card Repeat
5 Card Eject Or Track Step-up (In Track 50)
NOTE: Connector Information In Parenthesis For E/MC
NOTE: ALL VOLTAGES DC UNLESS INDICATED

DUMMY CHARACTER





Note: If Errors Occur, Check The Following:

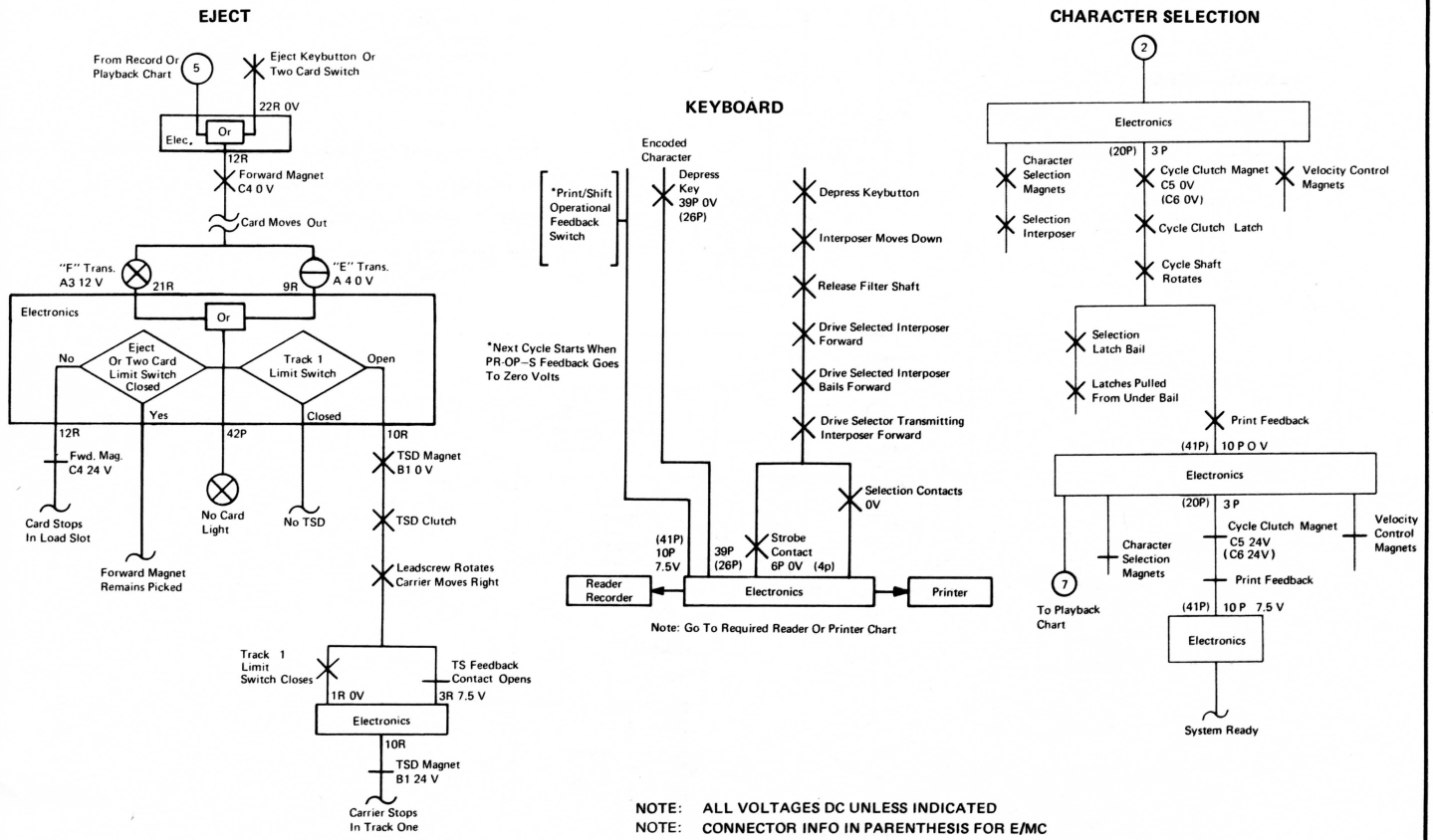
1. Magnetic Card
2. Magnetic Head — Do Not Clean With Abrasive Material — Use Water For Best Results
3. Card Movement
4. Board "0"
5. Electronics

E/MC Plays In Line Mode When End Of Ribbon Voltage Is 0V (Pin 1)

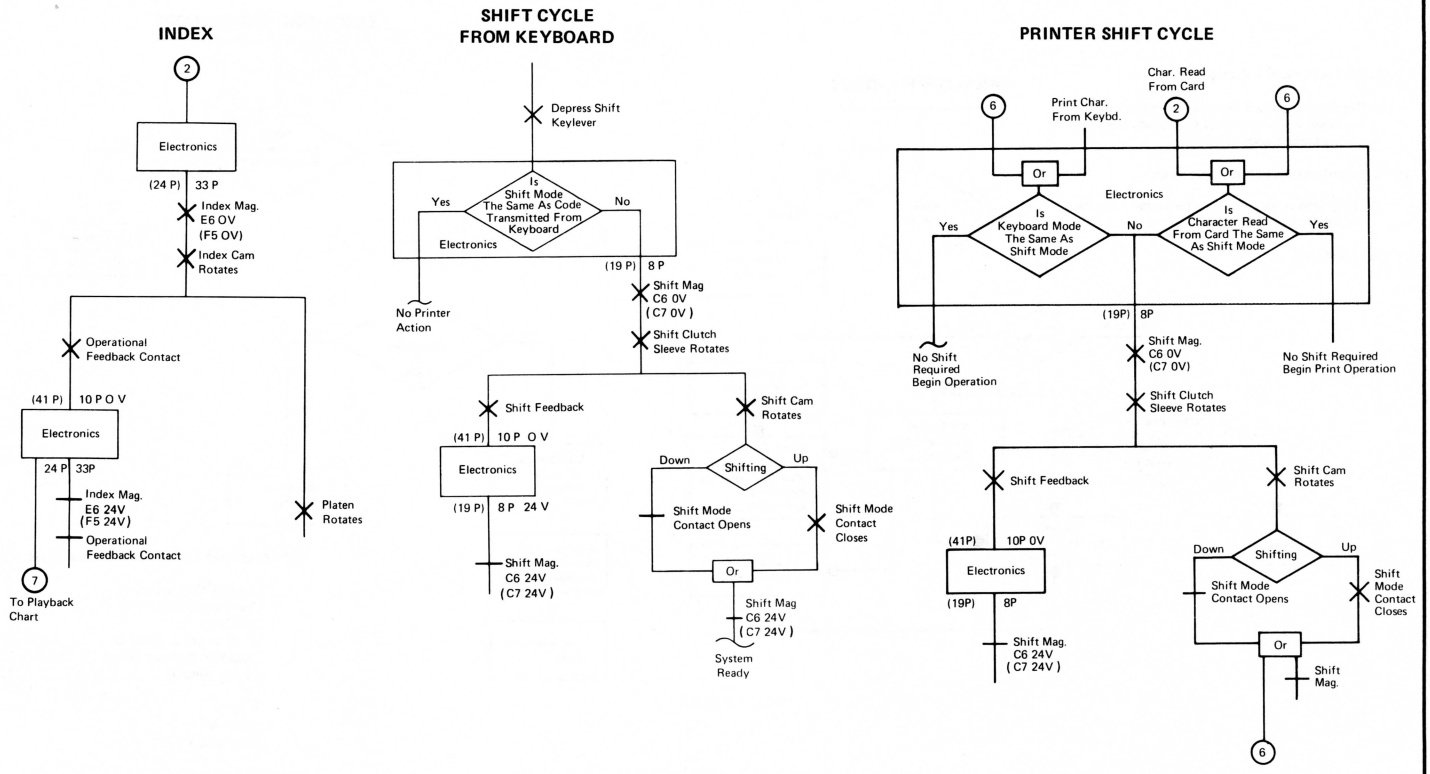
*Next Cycle Starts When Pr-Op-S Feedback Goes To Zero Volts

NOTE: ALL VOLTAGES DC UNLESS INDICATED

Note: Connector Information In Parenthesis For E/MC



NOTE: ALL VOLTAGES DC UNLESS INDICATED
NOTE: CONNECTOR INFO IN PARENTHESIS FOR E/MC



NOTE: ALL VOLTAGES DC UNLESS INDICATED
NOTE: CONNECTOR INFO IN PARENTHESIS FOR E/MC

I. To put tabs into the electronic logic:

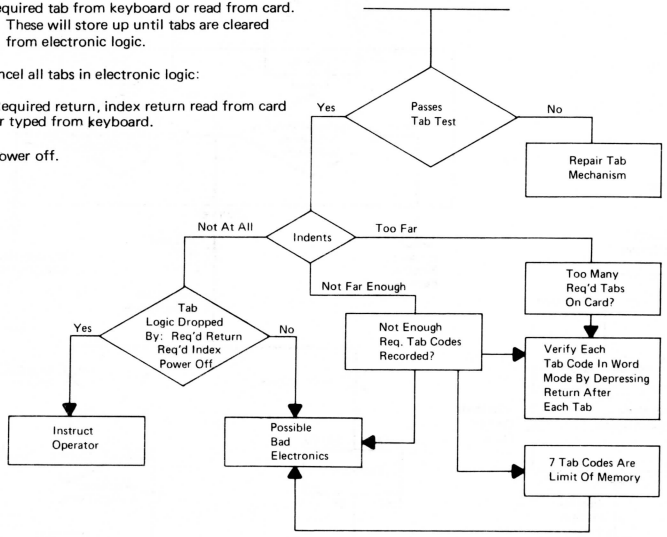
A. Required tab from keyboard or read from card.
1. These will store up until tabs are cleared from electronic logic.

II. To cancel all tabs in electronic logic:

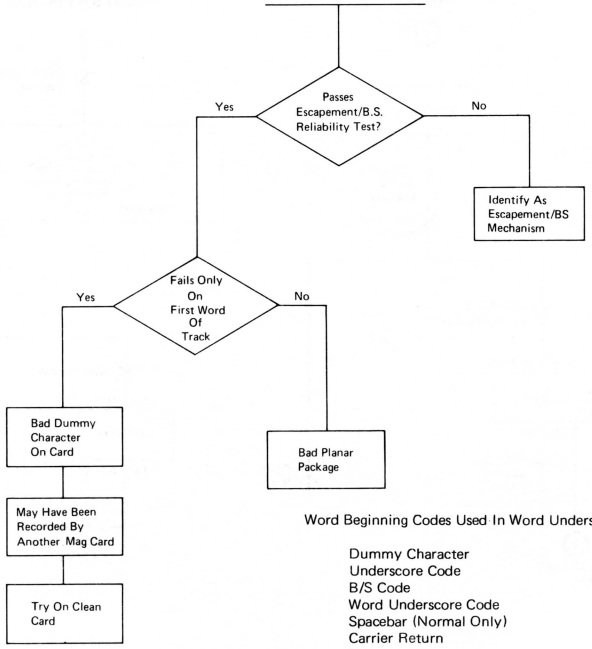
A. Required return, index return read from card or typed from keyboard.

B. Power off.

PARAGRAPH INDENT



E/MC WORD UNDERSCORE

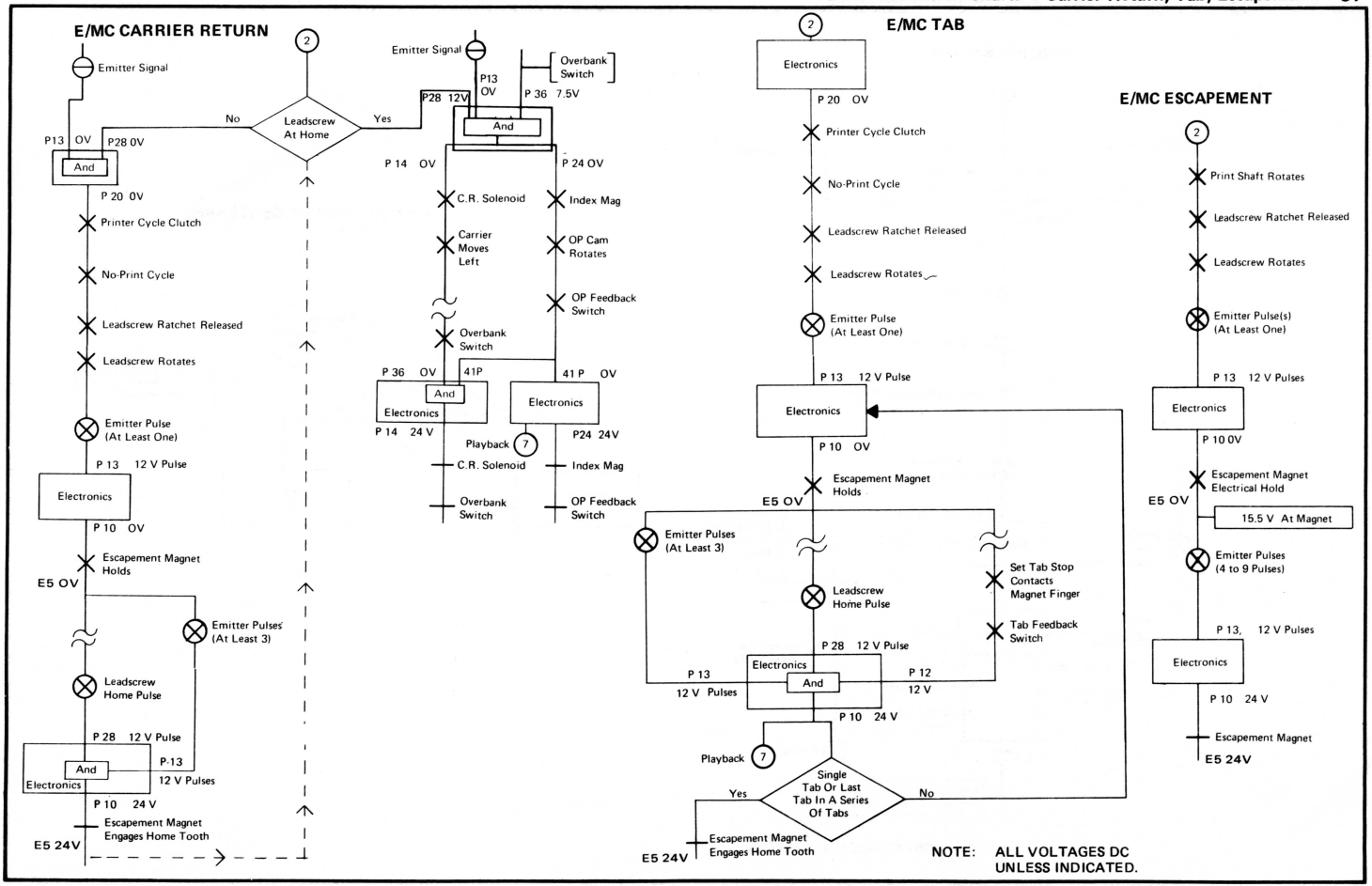


Word Beginning Codes Used In Word Underscore

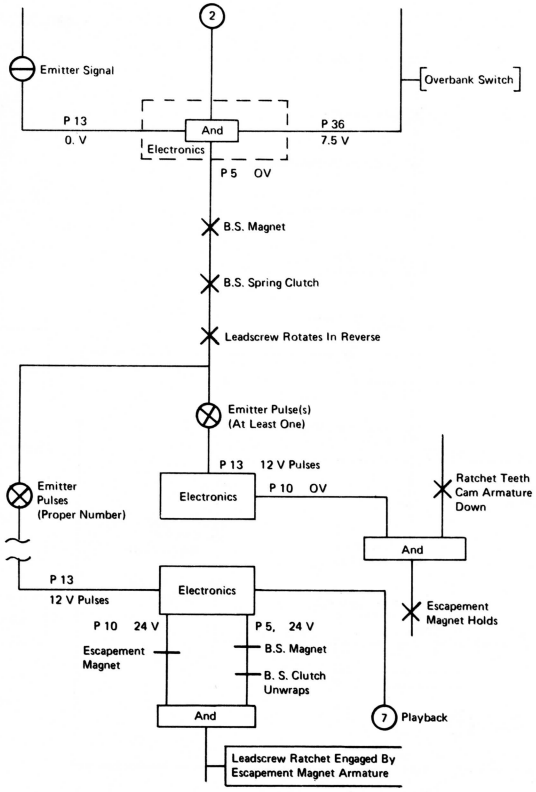
Dummy Character
Underscore Code
B/S Code
Word Underscore Code
Spacebar (Normal Only)
Carrier Return
Tab
Index
Subscript
Superscript

Does Not Include:

Required Space
Delete Code
Stop Code

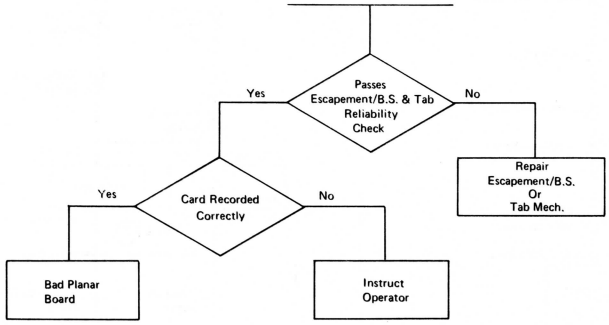

E/MC CARRIER RETURN
2
Emitter Signal
No
Leadscrew At Home
Yes
P13 OV
P28 0V
And
P 20 0V
Printer Cycle Clutch
No-Print Cycle
Leadscrew Ratchet Released
Leadscrew Rotates
Emitter Pulse (At Least One)
P 13 12 V Pulse
Electronics
P 10 OV
Escapement Magnet Holds
E5 OV
Emitter Pulses (At Least 3)
Leadscrew Home Pulse
P 28 12 V Pulse
And
Electronics
P-13
12 V Pulses
P 10 24 V
Escapement Magnet Engages Home Tooth
E5 24V
Emitter Signal
P13 OV
Overbank Switch
P 36 7.5V
P28 12V
And
P 14 OV
P 24 OV
C.R. Solenoid
Index Mag
Carrier Moves Left
OP Cam Rotates
OP Feedback Switch
Overbank Switch
P 36 OV
41P
41 P OV
And
Electronics
P 14 24 V
P24 24V
Playback
7
C.R. Solenoid
Index Mag
Overbank Switch
OP Feedback Switch
2
E/MC TAB
Electronics
P 20 OV
Printer Cycle Clutch
No-Print Cycle
Leadscrew Ratchet Released
Leadscrew Rotates
Emitter Pulse (At Least One)
P 13 12 V Pulse
Electronics
P 10 OV
Escapement Magnet Holds
E5 OV
Emitter Pulses (At Least 3)
Leadscrew Home Pulse
Set Tab Stop Contacts Magnet Finger
Tab Feedback Switch
P 28 12 V Pulse
Electronics
And
P 13
12 V Pulses
P 12
12 V
P 10 24 V
Playback
7
Single Tab Or Last Tab In A Series Of Tabs
Yes
No
Escapement Magnet Engages Home Tooth
E5 24V
E/MC ESCAPEMENT
2
Print Shaft Rotates
Leadscrew Ratchet Released
Leadscrew Rotates
Emitter Pulse(s) (At Least One)
P 13 12 V Pulses
Electronics
P 10 0V
Escapement Magnet Electrical Hold
E5 OV
15.5 V At Magnet
Emitter Pulses (4 to 9 Pulses)
P 13, 12 V Pulses
Electronics
P 10 24 V
Escapement Magnet
E5 24V
NOTE: ALL VOLTAGES DC UNLESS INDICATED.

E/MC BACKSPACE

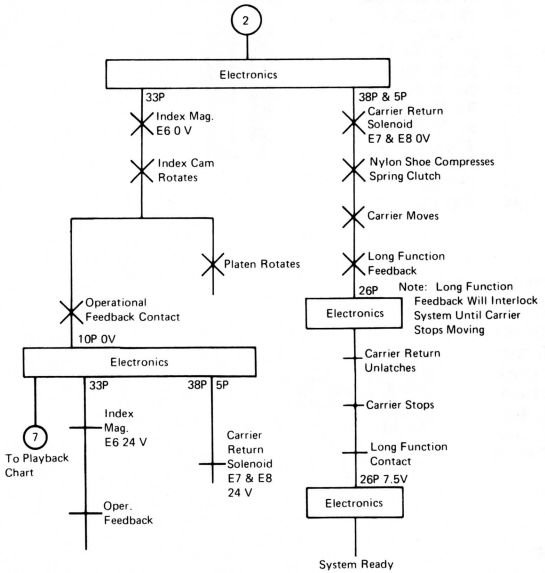


NOTE: ALL VOLTAGES DC UNLESS INDICATED

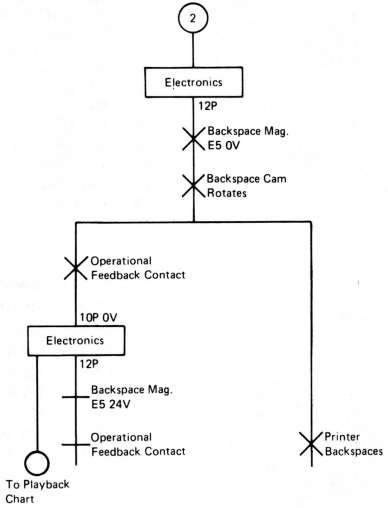
E/MC AUTOMATIC CENTERING



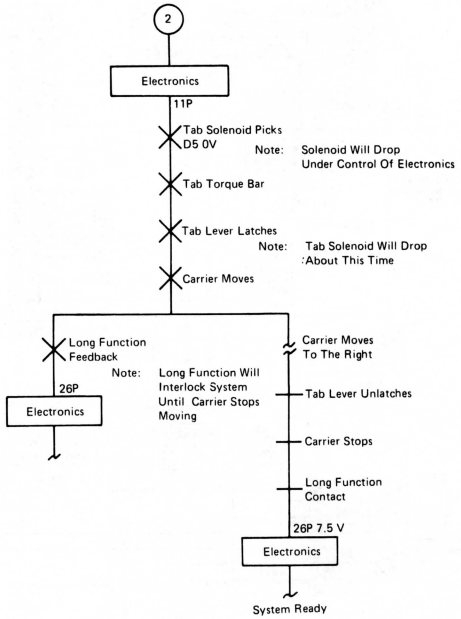
MC CARRIER RETURN



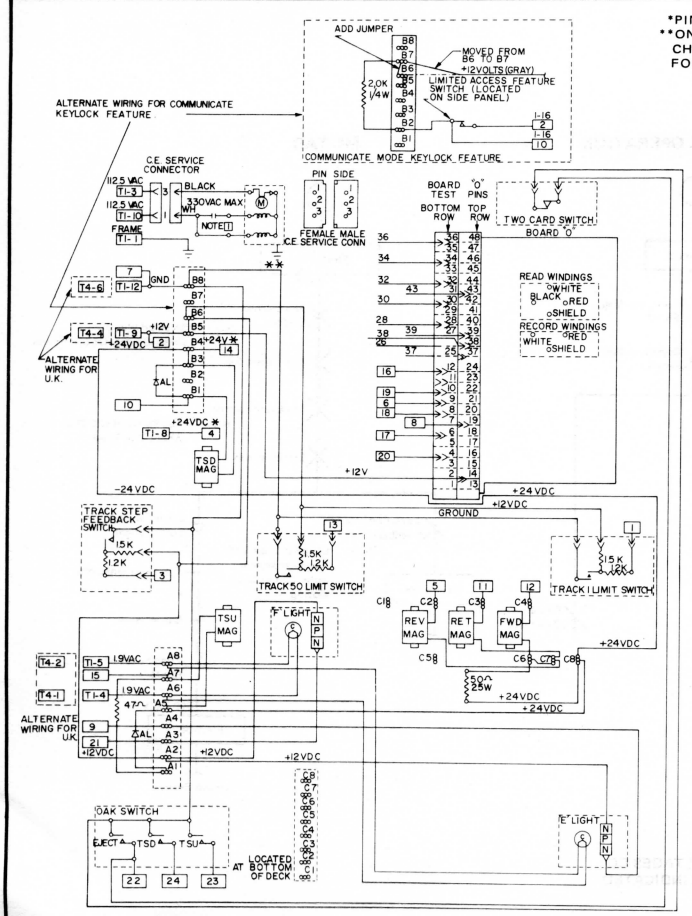
MC BACKSPACE OPERATION



MC TAB



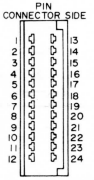
NOTE: ALL VOLTAGES DC
UNLESS INDICATED.



*PINS 4 & 14 CONNECTED ON PLANAR BOARD
**ON 3 WIRE MACHINES ONLY
CHANGED WIRING ON EDGE CONNECTOR 'B' - IN CTU FOR COMMUNICATE MODE KEYLOCK FEATURE

PIN ASSIGNMENT

PIN	NAME	PIN	NAME
1	TK1 Limit Sw.	13	TK50 Limit Sw.
2	+12 VDC T1-9	14	+24 VDC B-4
3	TK Step FB	15	TSU Mag.
4	+24 V — T1-8	16	Bd. '0' Pin 12
5	Rev. Mag.	17	Bd. '0' Pin 6
6	Bd. '0' Pin 9	18	Bd. '0' Pin 8
7	T1-12 Grd.	19	Bd. '0' Pin 10
8	Bd. '0' Pin 19	20	Bd. '0' Pin 4
9	'E' Light A-4	21	'F' Light A-3
10	TSD Mag.	22	Eject Kb.
11	Ret. Mag.	23	TSU Kb.
12	Fwd. Mag.	24	TSD Kb.



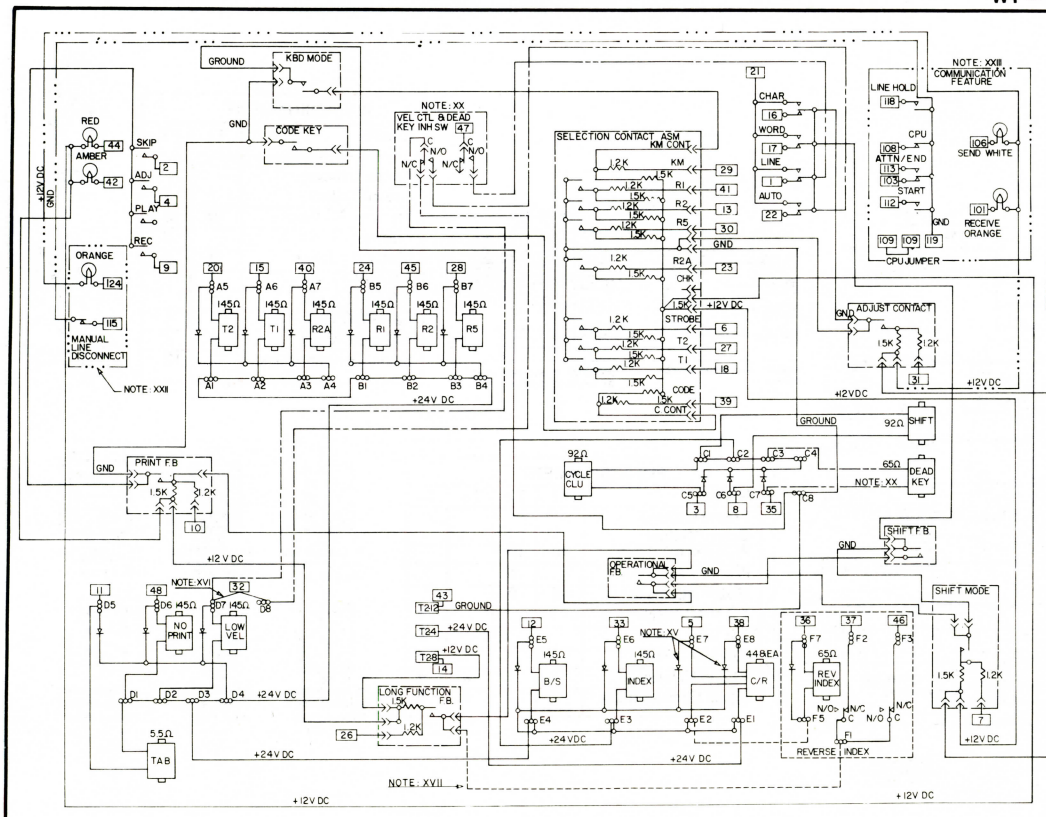
R/R T1 CONNECTOR PIN ASSIGNMENT

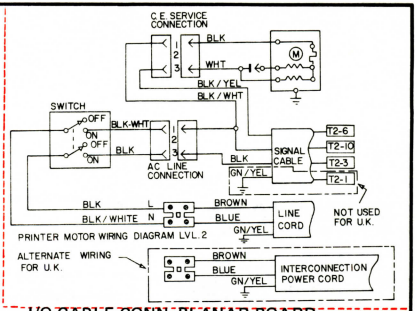
T1-1	Ground Gr./Yel.
T1-3	115 VAC Black
T1-4	1.9 VAC Black
T1-5	1.9 VAC Black
T1-8	+24 VDC Red
T1-9	+12 VDC Gray
T1-10	115 VAC Black
T1-12	Ground



COLOR CODE

+24 VDC — Red
+12 VDC — Gray
1.9 VAC — Black
Primary Wiring — Black
Signal Ground — Black
Frame Ground — Gn./Yel.





I/O CABLE CONN. PLANAR BOARD

PIN ASSIGNMENT			
PIN	NAME	PIN	NAME
1	Line	13	R2 Cont.
2	Skip	14	Pin 8 T2Conn.*
3	C/C Mag.	15	T1 Mag.
4	Adjust	16	Char.
5	C/R Mag.	17	Word
6	Strobe	18	T1 Cont.
7	Shift Mode	19	Spare
8	Shift Mag.	20	T2 Mag.
9	Record	21	Sec. Mode
10	Print FB	22	Auto
11	Tab Mag.	23	R2A Cont.
12	B/S Mag.	24	R5 Mag.
25	Spare	37	Double Ind.Sw.
26	Long Funct.	38	C/R Mag.
27	T2 Cont.	39	Code Key
28	R1 Mag.	40	R2A Mag.
29	Kbd. Mode	41	R1 Cont.
30	R5 Cont.	42	No Card
31	Adj. Mode	43	Pin 12 T2 Conn**
32	Low Vel.	44	Error
33	Index Mag.	45	R2 Mag.
34	Spare	46	Single Ind. Sw.
35	DeadkeyMag.	47	VC & DK Inh. Sw.
36	Rev.Ind.Mag.	48	No Print



*Pin 2 T-3 Conn. For UK

**Pin 3 T-3 Conn. For UK

NOTES:

X ALL RESISTORS ARE 1/4 WATT IF NOT NOTED

XI 24V WIRE ENTERING PRINTER FROM T2-4 IS RED, AWG 18
12V WIRE ENTERING PRINTER FROM T2-8 IS GRAY, AWG 18
12V WIRE GOING TO POSITION 14 FROM 48 POS CONN IS GRAY, AWG 18
12V WIRE GOING TO LONG FUNCTION F.B. CONTACT IS BLACK/RED, AWG 18

XII SIGNAL GROUND WIRE ENTERING PRINTER FROM T2-12 IS BLACK
SIGNAL GROUND WIRE GOING TO POS C-8 IN PRINTER IS BLACK/RED
SIGNAL GROUND WIRE GOING TO POS 43 FROM 48 POS CONN. IS BLACK

XIII SEE PATENT PLATE ON PRINTER FOR MOTOR VOLTAGE & FREQ.

XIV NOTED DIODES ARE TYPE GY ALL OTHERS ARE TYPE ALS

XV LEAD 32 TO D7 IF VEL. CTL. & DEAD KEY INH SWS ARE NOT INSTALLED
LEAD 32 TO D8 IF VEL. CTL. & DEAD KEY INH SWS ARE INSTALLED

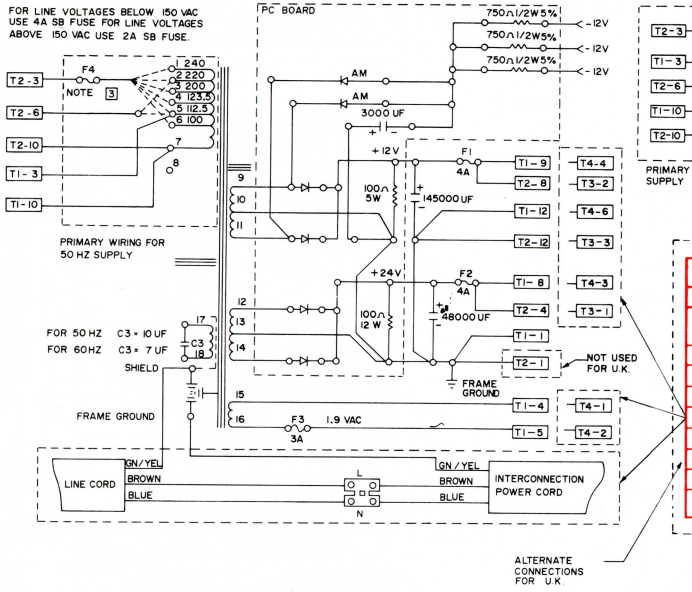
XVI LEADS & COMPONENTS SHOWN IN DOTTED LINES (- - - - -) ARE TO BE USED ONLY IN MACHINES WITH REV. INDEX

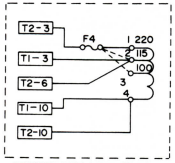
XVII SCHEMATIC ONLY USED FOR PRINTERS WITH RFI-FILTER

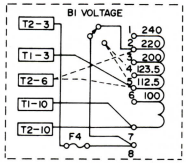
XIX LEADS & COMPONENTS SHOWN IN PHANTOM (-----) ARE TO BE USED IN MACHINES WITH VELOCITY CONTROL & DEAD KEY

XX INSTALLED ONLY IN MACHINES FOR COUNTRIES REQUIRING MANUAL LINE DISCONNECT

XXII LEADS & COMPONENTS SHOWN IN PHANTOM (—·—·—) ARE TO BE USED IN MACHINES WITH COMMUNICATING FEATURE



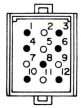




PIN ASSIGNMENT		
NAME	T1	T2
Frame Ground Green/Yellow	1	1
Primary AC Black	10	10
Primary AC Black	—	3
Motor AC Black	3	6
1.9 VAC Black	4	
1.9 VAC Black	5	
+24 VDC Red	8	4
+12 VDC Gray	9	8
Signal Ground Black	12	12



T1 CONNECTION READER FEMALE PLUG



T2 CONNECTION PRINTER MALE PLUG

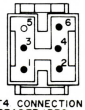
PIN ASSIGNMENT				
NAME	T1	T2	T3	T4
Frame Ground Green/Yellow	1			
Primary AC Black	10	10		
Primary AC Black		3		
Motor AC Black	3	6		
1.9 VAC Black				1
1.9 VAC Black				2
+24 VDC Red			1	3
+12 VDC Gray			2	4
Signal Ground Black			3	6



T1 CONNECTION READER/REC MALE PLUG



T2 CONNECTION POWER SUPPLY MALE PLUG



T4 CONNECTION READER/REC MALE PLUG



T1 CONNECTION POWER SUPPLY FEMALE PLUG



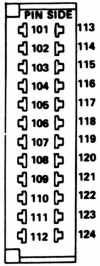
T3 CONNECTION POWER SUPPLY MALE PLUG



T4 CONNECTION POWER SUPPLY FEMALE PLUG

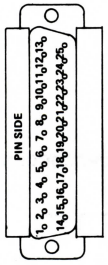
AUXILIARY I/O CABLE CONNECTOR

PIN	NAME	PIN	NAME
101	Receive	113	Attn. N/O
102	CPU (Jumper)	114	Spare
103	Attn. N/C	115	Man. Disc. N/O
104	Spare	116	Spare
105	I/O Spare	117	Spare
106	Send	118	Line Hold N/O
107	Spare	119	Ground
108	CPU N/C	120	Spare
109	CPU Jumper	121	–
110	Keybd. Lock	122	–
111	Spare	123	–
112	Start N/O	124	Man. Disc. Lite



DATA SET CABLE CONNECTORS

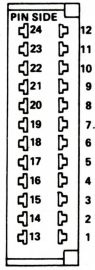
DATA SET CONN.



PIN ASSIGNMENT

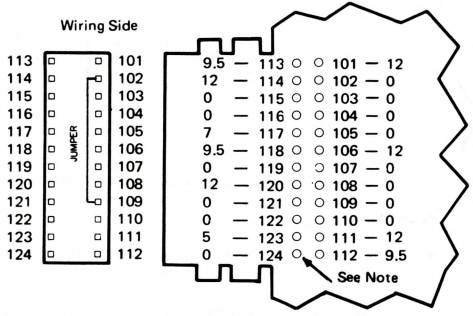
PIN	NAME	PIN
8	Carrier Detector	6
5	Clear To Send	9
6	Data Set Ready	24
20	Data Terminal Ready	*
3	Received Data	11
4	Request To Send	21
7	Signal Ground	19
12		18
2	Transmitted Data	7
–	-12 VDC	20

PLANAR BD. CONN.



*For WT CMC "Data Terminal Ready" Is Coming From Delay Card

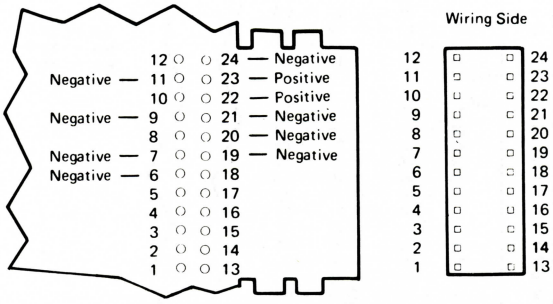
COMMUNICATING MAG CARD STATIC VOLTAGE CHECK



Unlatch Line Disconnect Button On Machines With Manual Line Disconnect

Note: Pin 124P Has 10 VDC On Machines With Manual Line Disconnect

DATA SET



Note: Data Set Connector Pins Are Numbered As Printed On Connector Plug

Voltage Is Considered Positive If Level Is .6 VDC & Above

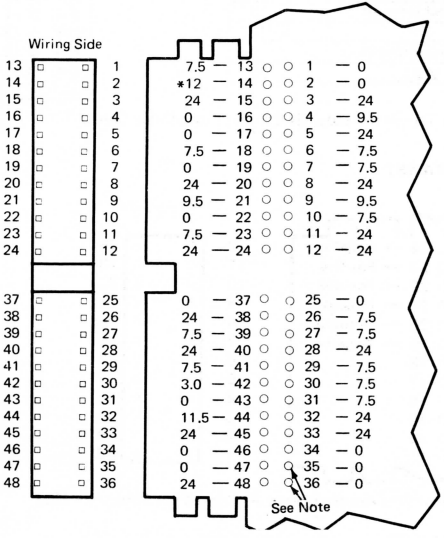
Voltage Is Considered Negative If Level Is Below .6 VDC

It Is Not Necessary To Check Pins Which Are Not Indicated

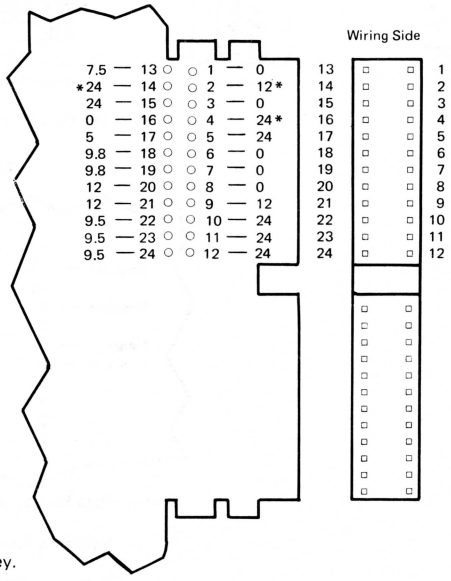
COMMUNICATING MAG CARD STATIC VOLTAGE CHECK

All voltages are DC ± 20%, except supply *voltages ± 10%. All readings are taken with the meter on the 30 VDC scale, the system in Skip, the magnetic head in track No. 1, no card loaded, printer and keyboard in lower case, Line Hold and CPU buttons unlatched, and the system in an off-line condition. (The data set cable should be plugged in.) Machines with Reverse Index, place index lever in the I I/2 position.

PRINTER



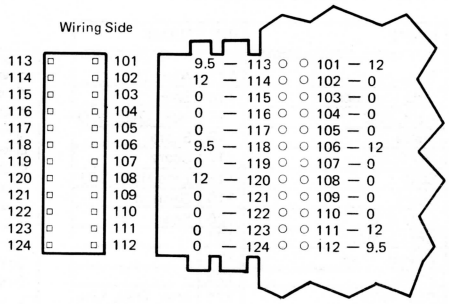
READER/RECORDER



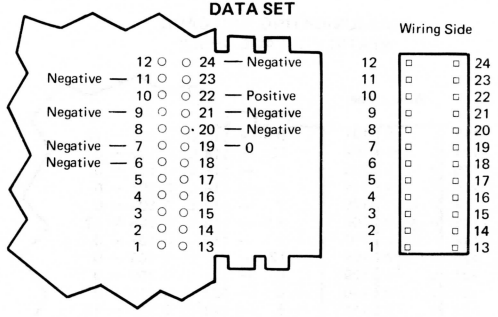
Note: Pin 35P Will Read 24 VDC On Machines With Dead Key.

Note: Pin 36P Will Read 24 VDC On Machines With Reverse Index.

AUXILIARY



DATA SET



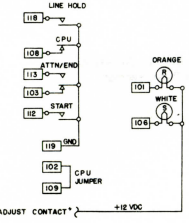
Note: The Data Set Connector Pins Are Numbered Exactly As Printed On The Connector Plug

Voltage Levels Of .6 VDC And Above Are Considered Positive

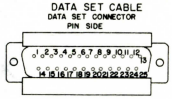
Voltage Levels Below .6 VDC Are Considered Negative

It Is Not Necessary To Check Those Pins Which Are Not Indicated

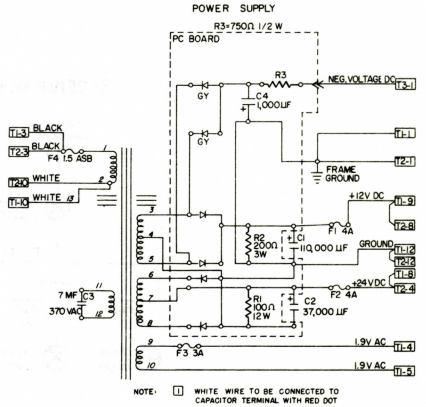
AUXILIARY I/O CABLE



DATA SET CABLE



POWER SUPPLY



AUXILIARY I/O CABLE CONNECTOR

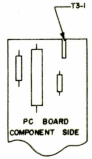
PIN	NAME	PIN	NAME
101	Receive	113	Attn. N/O
102	CPU (Jumper)	114	Spare
103	Attn. N/C	115	I/O Spare
104	Spare	116	Spare
105	Spare	117	Spare
106	Send	118	Line Hold N/O
107	Spare	119	Ground
108	CPU N/C	120	Spare
109	CPU (Jumper)	121	Spare
110	Kybd. Lock	122	Spare
111	Spare	123	Spare
112	Start	124	I/O Spare

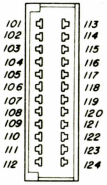
DATA SET CABLE CONNECTORS

PIN ASSIGNMENT		
NAME	DATA SET CONN. PIN NO.	PLANAR PKG. CONN. PIN NO.
Carrier Detector (D)	8	6
Clear To Send (D)	5	9
Data Set Ready (D)	6	24
Data Terminal Ready (P)	20	22
Received Data (D)	3	11
Request To Send (P)	4	21
Signal Ground (P)	7	19
Spare	12	18
Transmitted Data (P)	2	7
-12 VDC (P)	—	20
Ground (Ground Wire To Power Supply Frame)	1	—

COLOR CODE

+24 VDC — Red
+12 VDC — Gray
Ground — Black
1.9 VAC — Black
-12 VDC — Blue

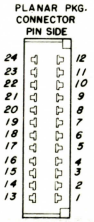




Note:

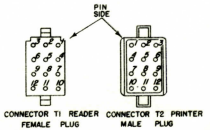
(D) - Signal From Data Set

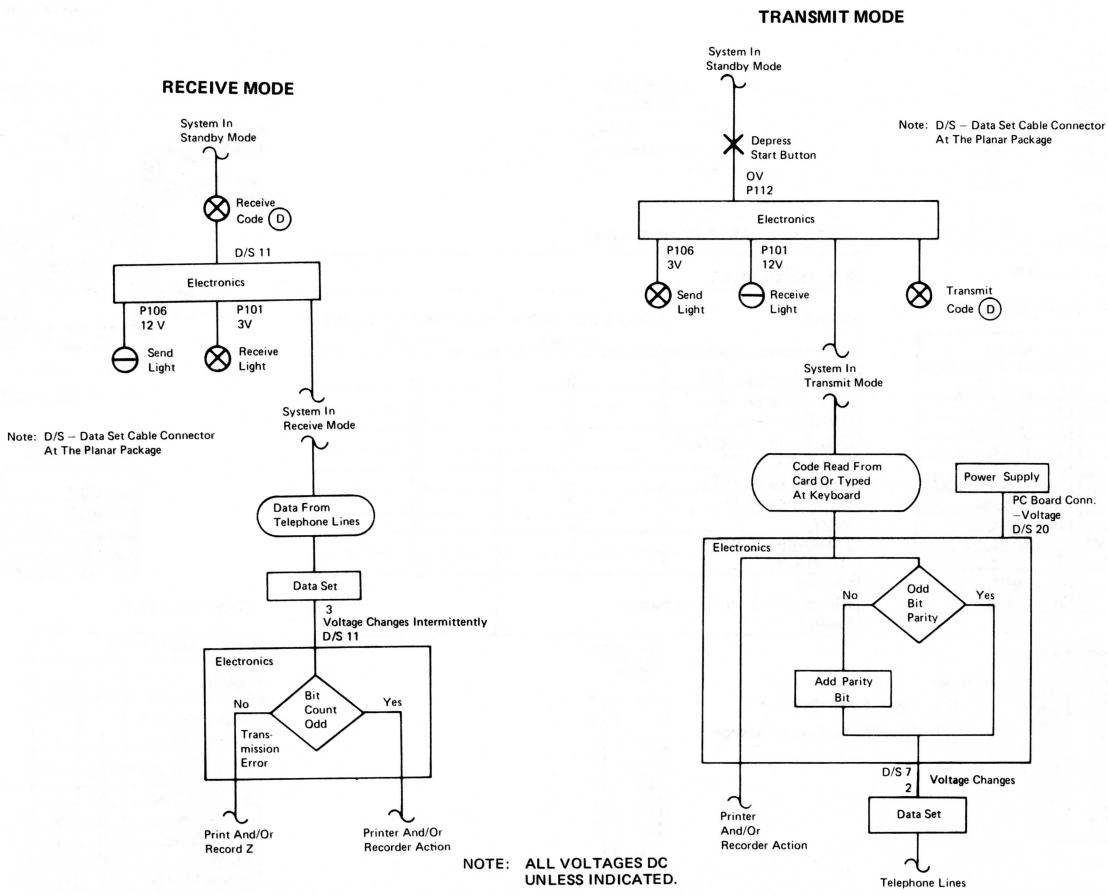
(P) - Signal From Planar Package



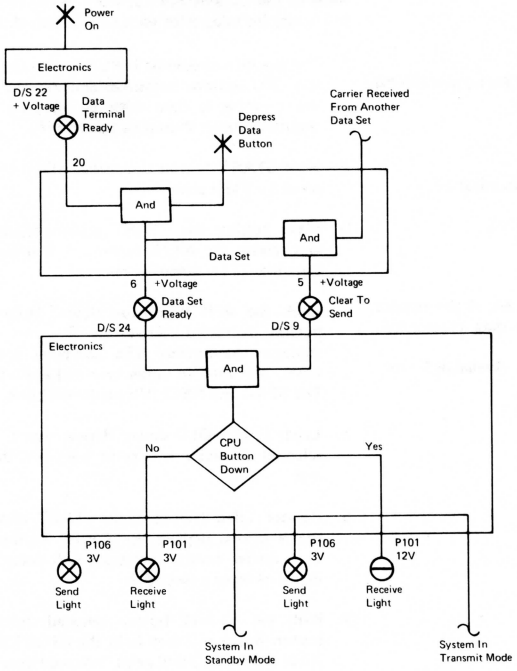
POWER SUPPLY

PIN ASSIGNMENT		
NAME	T1	T2
Frame Ground Green/Yellow	1	1
AC Black	3	3
1.9 VAC Black	4	
1.9 VAC Black	5	
+24 V Red	8	4
+12 V Gray	9	8
AC White	10	10
Ground Black	12	12

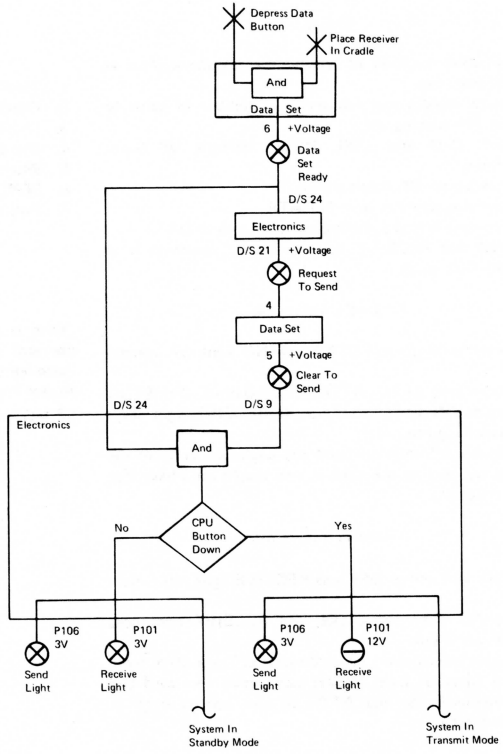



RECEIVE MODE
System In Standby Mode
Receive Code D
D/S 11
Electronics
P106 12 V
P101 3V
Send Light
Receive Light
System In Receive Mode
Note: D/S — Data Set Cable Connector At The Planar Package
Data From Telephone Lines
Data Set
3 Voltage Changes Intermittently D/S 11
Electronics
No
Bit Count Odd
Yes
Trans-mission Error
Print And/Or Record Z
Printer And/Or Recorder Action
TRANSMIT MODE
System In Standby Mode
Depress Start Button
OV P112
Note: D/S — Data Set Cable Connector At The Planar Package
Electronics
P106 3V
P101 12V
Send Light
Receive Light
Transmit Code D
System In Transmit Mode
Code Read From Card Or Typed At Keyboard
Power Supply
PC Board Conn. —Voltage D/S 20
Electronics
No
Odd Bit Parity
Yes
Add Parity Bit
D/S 7 2
Voltage Changes
Data Set
Printer And/Or Recorder Action
Telephone Lines
NOTE: ALL VOLTAGES DC UNLESS INDICATED.

STANDBY MODE
103A-2 OR EQUIVALENT



STANDBY MODE
113A DATA SET



NOTE: ALL VOLTAGES DC UNLESS INDICATED.

NOTE: D/S — DATA SET CABLE CONNECTOR AT THE PLANAR PACKAGE

SUMMARY OF COMMUNICATING PROCEDURES

(Point-To-Point)

Set-Up

1. Dial other location or answer the telephone after at least two rings.
2. Discuss margin and tab settings, number of cards to send, line spacing, etc.
3. Check CPU and LINE HOLD buttons UP (both stations).
4. Check power ON (both stations).
5. Answering operator goes to DATA.
6. When tone is heard, dialing operator goes to DATA.
7. SEND and RECEIVE lights come on, machine is in STANDBY mode.

To Send Information

1. Momentarily depress START. SEND light will remain ON.
2. Momentarily depress ATTN. (If lights blink, then SEND remains ON alone, continue. If RECEIVE light stays ON alone, go to talk.)
3. Transmit information from the keyboard or from the card by playing the card as you would on a base Mag Card System.

To Receive Information

1. SEND light will go OFF and RECEIVE light will remain ON.
2. If SEND light comes ON, and RECEIVE light goes OFF, go to talk.
3. Receive information. (If card ejects at Track 50 or from Card Eject or Card Repeat code, load new card and momentarily depress ATTN to give control back to Originator.)

If both SEND and RECEIVE lights go OFF, go to TALK.*

(CPU Mode)

Set-Up

1. Turn power ON.
2. Check LINE HOLD button UP and CPU button DOWN.
3. Check paper, margins, tabs, cards, etc.
4. Dial CPU telephone number.
5. When tone is heard, go to DATA.
6. SEND light will come on.
7. Follow program procedures for communication.

If both SEND and RECEIVE lights go OFF, redial.*

*With certain data sets such as the 113A, if the remote operator goes to TALK or breaks the data connection, these lights will not go off.
Austin Product Service Data Set Test No. Available From CE MGT

CE AIDS

NOTE: If any of the CE aids fail, the problem is in the feature switches, lights, planar package or wiring. Check as a base machine first. With the addition of certain SERs, some of the CE aids will not work. Refer to the check-out procedure included with each SER installation instruction.

1. The machine should be in PLAY, with the LINE HOLD and CPU buttons unlatched and the card removed. (If the machine is used with an acoustic coupler, the acoustic coupler should be turned off.)

2. Hold START button depressed. SEND light will come on and a 9 will print.

3. While holding the START button depressed, depress and release the ATTN button. A 9 should print each time the ATTN button is released.

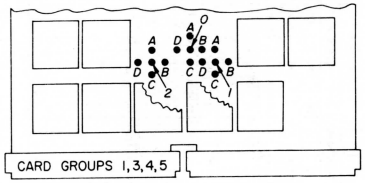
4. Lock the shift keybutton down. Hold the START button depressed. After the 9 prints, depress any character keybutton. The character will print two times, one time in upper case and again in lower case. The SEND and RECEIVE lights will blink.

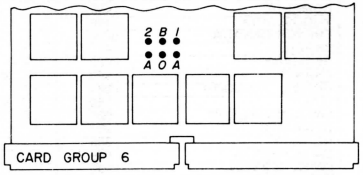
5. Latch LINE HOLD down. Repeat step 4. This time the selected character will print only one time, in upper case.

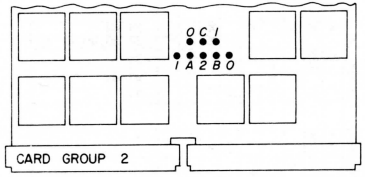
6. Release LINE HOLD. Hold START depressed. After the 9 prints, depress the Carrier Return Keybutton. Two carrier return operations will occur followed by the printing of a second 9.

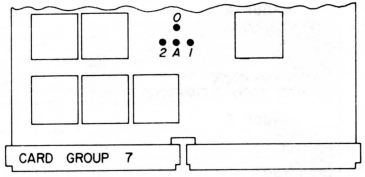
7. With the START button released, hold the CODE button down and then hold the START button down. After a delay, a 9 will print, followed by a series of W's.

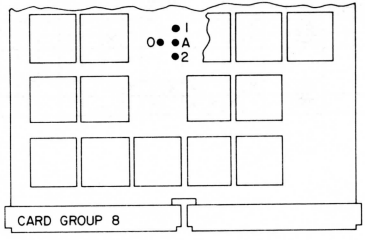
8. Tab away from the left margin. Latch the CPU button down. Hold START depressed. After the 9 prints, depress the index keybutton. An index operation and a Carrier Return operation will take place followed by a second 9.







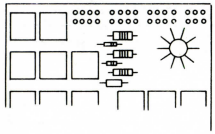




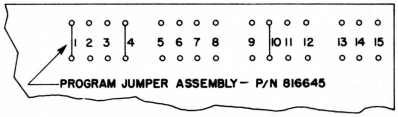
PROGRAM PIN JUMPER CHART

GROUP 1 CARD	KYBD NO.	AS HOME COUNTRY JUMPER	AS FIRST ALT COUNTRY JUMPER	AS SECOND ALT COUNTRY JUMPER
GERMANY	408	0 To A	1 To A	2 To A
SPAIN	420	0 To B	1 To B	2 To B
FRANCE	407	0 To C	1 To C	2 To C
ITALY	412	0 To D	1 To D	2 To D
GROUP 2 CARD				
CANADA – FRENCH	404	0 To A	1 To A	2 To A
CANADA – ENGLISH	404	0 To A	1 To A	2 To A
UNITED KINGDOM	424	0 To B	1 To B	2 To B
NETHERLANDS	415	0 To C	1 To C	2 To C
GROUP 3 CARD				
HUNGARY	411	0 To A	1 To A	2 To A
SWEDEN – FINLAND	421	0 To B	1 To B	2 To B
ROMANIA	419	0 To C	1 To C	2 To C
YUGOSLAVIA	425	0 To D	1 To D	2 To D
GROUP 4 CARD				
DENMARK	406	0 To A	1 To A	2 To A
NORWAY	416	0 To A	1 To A	2 To A
POLAND	417	0 To B	1 To B	2 To B
SWITZERLAND – FRENCH	422	0 To C	1 To C	2 To C
SWITZERLAND – GERMAN	423	0 To D	1 To D	2 To D
GROUP 5 CARD				
CZECHOSLOVAKIA	405	0 To A	1 To A	2 To A
JAPAN	413	0 To B	1 To B	2 To B
LATIN AMERICA	414	0 To C	1 To C	2 To C
BRAZIL	401	0 To D	1 To D	2 To D
PORTUGAL	418	0 To D	1 To D	2 To D
GROUP 6 CARD				
GREECE – LATIN	410	0 To B	1 To B	2 To B
GROUP 7 CARD				
BULGARIA	402	0 To A	1 To A	2 To A
GROUP 8 CARD				
RUSSIA	437	0 To A	1 To A	2 To A

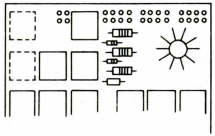
GROUP "A" KEYBOARD



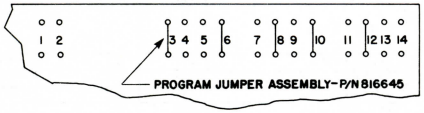
TYPICAL EXAMPLE FOR KEYBOARD NO 991



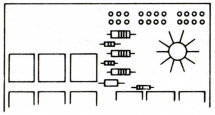
GROUP "B" & "C" KEYBOARDS



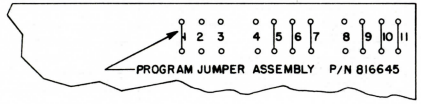
TYPICAL EXAMPLE FOR KEYBOARD NO. 948



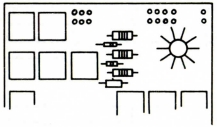
GROUP "D" KEYBOARD



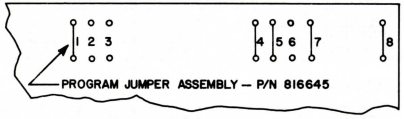
TYPICAL EXAMPLE FOR KEYBOARD NO. 368



GROUP "E" KEYBOARD

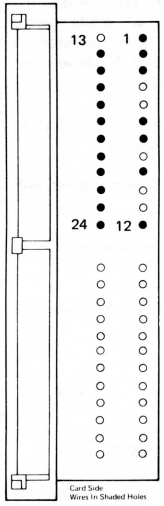


TYPICAL EXAMPLE FOR KEYBOARD NO. 586



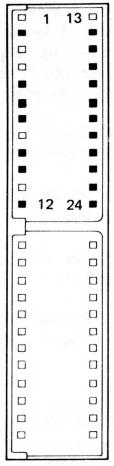
GROUP A	KBD. NO.	PROGRAM PIN POSITIONS 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	DEAD KEY POSITIONS
ROMANIA	489	X	X		X			X	X	X	X	X			X		43
YUGOSLAVIA	490							X		X	X	X			X		43
FRENCH/CANADA	493							X							X		42
BRAZIL	971						X	X									41, 42
GERMANY	982		X		X		X	X	X	X	X	X		X	X		43
FRANCE	983			X							X	X	X		X		41
UNITED KINGDOM	984										X				X	X	
ITALY	985			X					X		X	X			X		0
SWEDEN/FINLAND	986		X							X		X			X		39
DENMARK	987							X		X		X			X		43
NORWAY	988							X		X		X			X		43
SWISS/FRENCH	989					X		X		X	X			X	X		39
SWISS/GERMAN	990							X		X				X	X		39
THE NETHERLANDS	991	X			X						X						41, 42
PORTUGAL (HCESAR)	994						X	X									41, 42
PORTUGAL (AZERTY)	995						X	X									41, 42
GROUP B																	
CZECHOSLOVAKIA	491			X	X			X	X	X		X		X			39, 43
GREECE	693	X		X	X	X	X							X	X		38, 39, 40, 41, 42
ICELAND	695		X		X	X			X			X			X		42
SPAIN	948			X			X		X		X		X				41
LATIN AMERICA	970			X			X				X						41, 42
PUERTO RICO (DOMESTIC)	002			X			X		X		X		X				41
GROUP C																	
TURKEY	485						X	X	X					X	X		41
POLAND	499	X	X		X		X	X					X	X			
JAPAN	699	X		X		X			X	X							
HUNGARY	992	X	X			X	X					X					
GROUP D																	
JAPAN-KATAKANA-LATIN	368	X				X	X	X		X	X	X					37
FRENCH-ENGLISH (DOMESTIC)	057		X														0
JAPAN	698	X	X														
BULGARIA	364	X	X	X	X				X								
GROUP E																	
RUSSIA	386	X			X	X		X	X								
TURKEY	390		X	X	X		X										4

PARAGRAPH INDENT CABLE WIRING



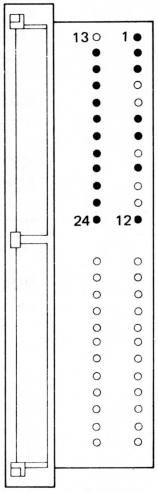
Card Side
Wires In Shaded Holes

Feature Board Position	Planar Package Connector Position
1	10
3	5
6	6
7	7
9	9
11	11
12	12
14	14
18	18
19	19
20	20
21	21
24	24
27	29
31	31
32	32
35	34
36	36
38	38
39	39
42	42
43	43
44	44
45	45
47	47
48	48



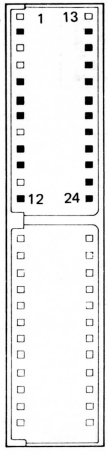
Planar Package
Connector — Pin Side
Pins In Shaded Holes

DEAD KEY & LOW VELOCITY CABLE ASSEMBLIES



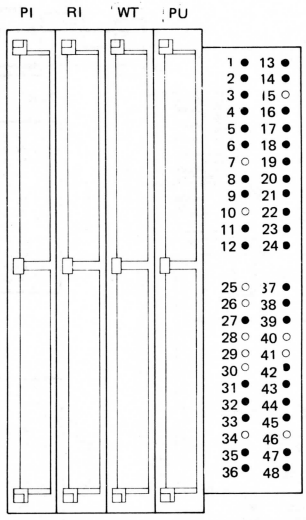
Card Side
Wires In Shaded Holes

Feature Board Position	Planar Package Connector Position
1	10
2	2
3	5
6	6
7	7
9	9
12	12
14	14
15	15
16	16
17	17
18	18
19	19
20	20
21	21
22	22
23	23
24	24



Planar Package
Connector — Pin Side
Pins In Shaded Holes

MULTIPLE CARD CABLE WIRING



Card Side
Wires In Shaded Holes

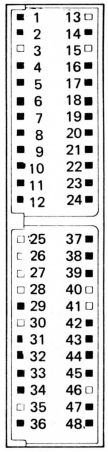
Feature Board Position	Planar Package Connector Position
1	10
2	2
3	5
4	16
5	6
6	7
8	20
9	9
11	11
12	12
13	1
14	14
16	4
17	17
18	18
19	19
20	8
21	21
22	22
23	23
24	24
27	29
31	31
32	32
33	33
35	34
36	36
37	37
38	38
39	39
42	42
43	43
44	44
45	45
47	47
48	48

PI = Paragraph Indent Card

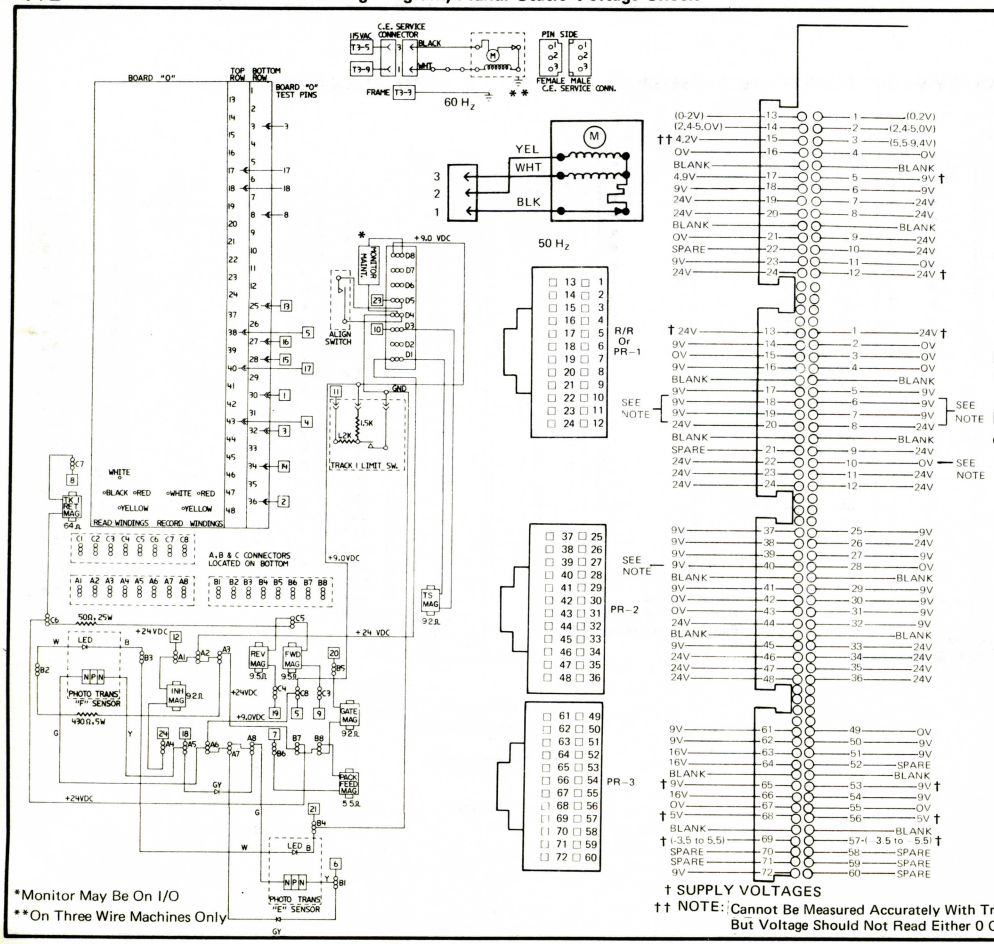
RI = Reverse Index Card

WT = Language Card

PU = Power Up Card



Planar Package
Connector Pin Side
Pins In Shaded Holes



MAG CARD II STATIC VOLTAGE CHECK

All voltages are DC ±10% except where tolerances are indicated by values in parenthesis. All readings are taken with the magnetic head in track 1, no card loaded, the printer and keyboard in lower case, all mode switch keybuttons up, alignment switch off, pitch selector 10 pitch, and end of ribbon sensor held down. Machines with Reverse Index, place index lever in the 1½ position.

NOTE: Pin 7P and 19P are used with multilingual feature and will read 9 VDC with control wheel centered.

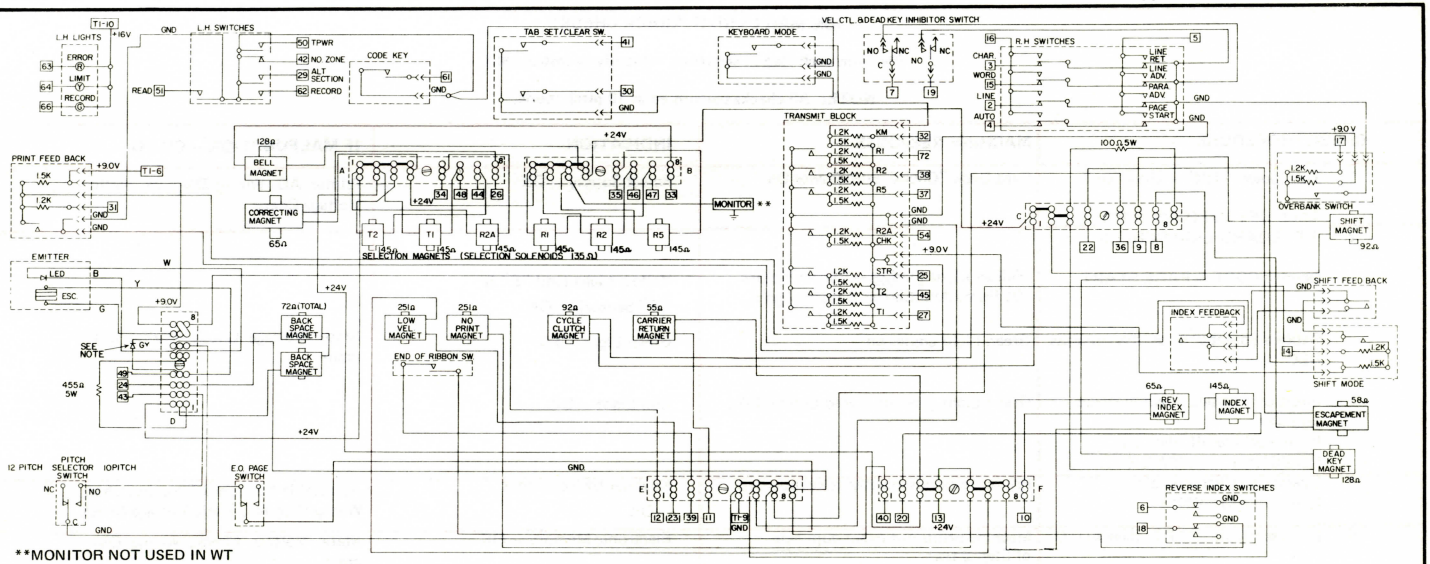
NOTE: Pin 6P and 18P will read 0 VDC on machines with Reverse Index.

NOTE: Pin 10P will read 24 VDC on machines with Reverse Index.

NOTE: Pin 40P will read 0 VDC until switch is operated on out of paper feature.

PIN ASSIGNMENT — R/R

PIN	NAME	PIN	NAME
1	Board "0" Pin 30	13	Board "0" Pin 25
2	Board "0" Pin 36	14	Board "0" Pin 34
3	Board "0" Pin 32	15	Board "0" Pin 28
4	Board "0" Pin 43	16	Board "0" Pin 27
5	Board "0" Pin 38 (+9.0 VDC)	17	Board "0" Pin 40
6	"E" Sensor	18	"F" Sensor
7	Feed Mag.	19	Rev. Mag.
8	TK1 Ret. Mag.	20	Gate Mag.
9	Fwd. Mag.	21	Ground
10	TS Mag.	22	Spare
11	TK1 Switch	23	Align. Switch
12	+24 VDC	24	Inh. Mag.



**MONITOR NOT USED IN WT

PIN ASSIGNMENT			
PIN	NAME	PIN	NAME
1	+24 VDC (T1-11)	13	+24 VDC
2	Line	14	Shift Mode
3	Char.	15	Word
4	Auto	16	Sec. Mode
5	Adv. Mode	17	Overbank Sw.
6	Double-Space Sw.	18	Single-Space Sw.
7	Multi. Cont.	19	Low Vel. Cont.
8	Dead Key Mag.	20	Index Mag.
9	Shift Mag.	21	Spare
10	Rev. Index Mag.	22	Escapement Mag.
11	C/R Mag.	23	Low Vel. Mag.
12	No Print Mag.	24	Backspace Mag.

PIN ASSIGNMENT			
PIN	NAME	PIN	NAME
25	Strobe	37	R5 Cont.
26	Correcting Mag.	38	R2 Cont.
27	T1 Cont.	39	End Of Ribbon
28	Ground (T1-12)	40	End Of Page
29	Alt. Section	41	Tab Set
30	Tab Clear	42	No Zone
31	PR-OP-S FB	43	Pitch Sw.
32	Kbd. Mode	44	T2 Mag.
33	Bell Mag.	45	T2 Cont.
34	R2A Mag.	46	R2 Mag.
35	R5 Mag.	47	R1 Mag.
36	C/C Mag.	48	T1 Mag.

PIN ASSIGNMENT			
PIN	NAME	PIN	NAME
49	Emitter	61	Code
50	TPWR	62	Record
51	Read	63	Error Light
52	Spare	64	Limit Light
53	+9.0 VDC (T1-6)	65	+9.0 VDC (T1-5)
54	R2A Cont.	66	Record Light
55	Ground (T1-8)	67	Ground (T1-9)
56	+5 VDC (T1-3)	68	+5 VDC (T1-4)
57*	-5 VDC (T1-1) Detect	69*	-5 VDC (T1-7)
58	Spare	70	Spare
59	Spare	71	Spare
60	Spare	72	R1 Cont.

NOTE: Diode On "D" Connector May Be Located On Emitter Assembly

*Pins 57 & 69 Connected On Planar Board

IBM MAG CARD II "QUICK CHECK"

(Perform each step in sequence — exactly as instructed.)

NOTE: All checks performed in 10 pitch mode.

CHECK PROCEDURE	MACHINE RESPONSE	INDICATION	IF MALFUNCTION — GO TO
1. Turn power "Off" — then "On" (ALL KEYBUTTONS "UP")	Card Deck "Clicks" with Power On	Power Supply — OK	Printer AC Wiring Diagram, Static Voltage Check
2. KEYBOARD LIGHT CHECK			
Depress CODE & PAGE START	Yellow Light Flashes — Carrier Return -01 Prints And Carrier Returns Again	Yellow Light (and "E" & "F" Sensor) — OK	
Depress Spacebar once, then depress REC	Green Light comes on	Green Light — OK	Static Voltage Check, Wiring Diagram
Insert card upside down in single card slot (turn machine off, then on) NO-ZONE ↓ TPWR ↓	Green Light goes off — Red Light blinks	Red Light — OK	
3. Operate all Character and Function Keybuttons	Printer responds exactly as keyboarded	Keyboard/Elec/Printer — OK	Applicable Keyboard Function Chart, Wiring Diagram, Static Voltage Check
4. Depress PAGE START, then AUTO	Machine prints out exact duplicate of Step 3 text	Electronic Memory — OK	Static Voltage Check, Wiring Diagram
5. Depress CODE and ₵/6	Carrier Returns	} Clear Memory from Keyboard — OK	Static Voltage Check, Wiring Diagram
Depress PAGE START and AUTO	No Machine Reaction		
6. Type several characters, then backspace to left margin	Text removed from paper	} Correction Feature — OK	Correction Feature, Function Chart
Depress PAGE START, then AUTO	No Machine Reaction		
7. Latch down ALT SECT, keyboard several characters, then unlatch ALT SECT	Keyboarded text prints	} Access ALT SECT — OK	Static Voltage Check, Wiring Diagram
Depress PAGE START, then AUTO	No Machine Reaction		
Latch down ALT SECT, then depress PAGE START — AUTO	Alt Sect text plays out		

(CONT.)

IBM MAGCARD II "QUICKCHECK"

(Perform each step in sequence — exactly as instructed.)

NOTE: All checks performed in 10 pitch mode.

CHECK PROCEDURE	MACHINE RESPONSE	INDICATION	IF MALFUNCTION — GO TO
Depress CODE and ¢/6 Depress PAGE START — AUTO (ALT SECT ↑ before continuing) NO-ZONE ↓ TPWR ↓	Carrier Returns No Machine Reaction	Clear ALT SECT — OK	Static Voltage Check
8. Place Exercise Card in Pack Feed Slot, then depress READ	Card ejected to Stacker Text read into memory	Total Card Drive OK Read Operation — OK	Read Function Chart, Voltage Check, Wiring Diagram
(STEP 8 DO BOTH PROCEDURES) Depress REC, then insert a completely erased card in card slot	Text recorded on card (Memory Retained)	Record Operation — OK	Voltage Check, Wiring Diagram, Record Function Chart
MEMORY ACCESS/MODE BUTTONS/DELETE FUNCTIONS **(TURN MACHINE "OFF," THEN "ON" — READ EXERCISE CARD INTO MEMORY)**			
ALL BUTTONS UP — NO-ZONE ↓ 9. Depress PAR ADV one time Depress LINE one time	Carrier Returns "Product --in the" plays out	PAR ADV — OK LINE playout — OK	
10. Depress LINE ADV one time Depress WORD one time	Carrier Returns The Word "period." plays out	LINE ADV — OK WORD playout — OK	Voltage Check, Wiring Diagram
11. Depress LINE RET one time * Depress CHAR/STOP one time	Carrier Returns The letter "p" prints out	LINE RET — OK CHAR playout — OK	
12. Depress CODE and LINE Depress LINE RET — then WORD	Printer spaces/backspaces The word "pover" prints out	Delete Function — OK	*On Machines With Format Feature, CHAR/STOP Should Be Depressed Twice To Receive Proper Response

(CONT.)

IBM MAG CARD II "QUICK CHECK"

(Perform each step in sequence – exactly as instructed.)

NOTE: All checks performed in 10 pitch mode.

LINE LENGTH/LINE COUNT/SCAN

(TURN POWER "OFF," THEN "ON" – START WITH ALL BUTTONS UP)

CHECK PROCEDURE	MACHINE RESPONSE	INDICATION	IF MALFUNCTION – GO TO
TPWR ↓ 13. Space EXACTLY 4 INCHES out from left margin, then depress CODE and PAR ADV	Carrier Returns	Line Length set – OK	
14. Depress CODE and LINE RET Enter line count of 03 TPWR ↑	No Machine Reaction "03" prints – then Carrier Returns	Line Count set OK	
15. Read Exercise Card thru single card slot (NOTE – CARD MUST BE REMOVED FROM SINGLE CARD SLOT BEFORE CONTINUING)			
Depress CODE and PAGE START	Yellow Light Blinks – Prints following 02 function		Planar Package Volage Check
Depress Carrier Return	Yellow Light Blinks – Prints following 03 function is to audit product machines	Line Count and Scan Logic	
Depress CODE and PAGE START	Yellow Light Blinks – Prints following 03 and short robot run on a daily basis Green Light comes on – (Wants card to record on)		

(CONT.)

IBM MAG CARD II "QUICK CHECK"

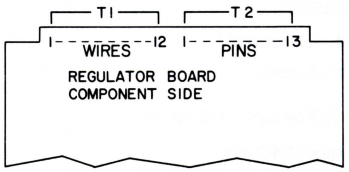
(Perform each step in sequence — exactly as instructed.)

NOTE: All checks performed in 10 pitch mode.

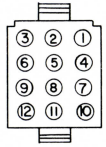
(TURN MACHINE "OFF," THEN BACK "ON" BEFORE CONTINUING)

TAB/DEC. TAB — CENTER/WORD UNDERSCORE

CHECK PROCEDURE	MACHINE RESPONSE	INDICATION	IF MALFUNCTION — GO TO
TPWR ↓ 16. Tab several times	Carrier stops every five spaces	5 space tab grid — OK	Planar Static, Voltage Check
17. Depress TAB CLR and CARR RETURN Depress TAB	Carrier Returns Carrier moves to far right limit	Tab Clear — OK	Voltage Check, Wiring Diagram
18. Depress TAB SET and CARR RETURN Tab several times Carrier Return TPWR ↑	Carrier Returns Carrier stops every five spaces	TAB Set — OK	
19. Depress code and ¼/½ Three times keyboard 1.00, then CARR RET Depress CODE and ¼/½ Three times. keyboard 22.00, then CARR RET	Machine prints out as follows: 1.00 22.00	DEC TAB — OK	Static Voltage Check
20. Space to center of page Depress CODE and letter "C" Enter five N's — Req Spc — Five N's Depress CODE and "I"	Machine prints out at center of page: NNNNN NNNNN	Centering Word Underscore — OK	



PIN CONNECTOR SIDE

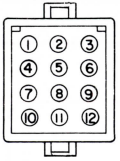


I/O T1 CONNECTOR AT REGULATOR BOARD FEMALE PLUG
ALSO
I/O T3 CONNECTOR AT POWER SUPPLY FEMALE PLUG

CONNECTOR WIRING SIDE



PIN CONNECTOR SIDE



I/O T3 CONNECTOR AT POWER SUPPLY MALE PLUG
ALSO
I/O T1 CONNECTOR AT REGULATOR BD MALE PLUG

I/O T1 CONNECTOR
REGULATOR BOARD

PIN	NAME
1	-5 VDC Detect
2	-16 VDC
3	+5 VDC
4	+5 VDC
5	+9.0 VDC
6	+9.0 VDC
7	-5 VDC
8	Ground
9	Ground
10	+16 VDC
11	+24 VDC
12	Ground

T2 CONNECTOR
POWER SUPPLY

PIN ASSIGNMENT	
PIN	NAME
1	Ground
2	
3	Ground
4	XFMR-8
5	+40K Capacitor
6	XFMR-6
7	
8	
9	XFMR-5
10	+24K Capacitor
11	XFMR-3
12	
13	

I/O T3 CONNECTOR
AC POWER

PIN ASSIGNMENT	
PIN	NAME
1	
2	AC Blk. (T3-5)
3	Frame Gnd. Gn./Yel.
4	
5	R/R Motor (T3-2)
6	
7	
8	
9	R/R Motor (T3-12)
10	
11	
12	AC Blk./Wht. (T3-9)

POWER SUPPLY CHECK MC II, MC/A

FUSES

1. With power on, voltages should be the same at both ends of a fuse. With power off, use a resistance reading to check fuses. TURN OFF POWER BEFORE REMOVING OR REPLACING A FUSE.

   a. 30VDC scale — 24VDC between ground and both ends of the top fuse on the board. The 24V fuse is 3 amp.
   b. 30VDC scale — 16VDC between ground and both ends of the bottom fuse on the board. The 16V fuse is 4 amp.
   c. **RX1** scale — 0 ohms between the end caps of either fuse with the fuse removed.

TRANSFORMER OUTPUT

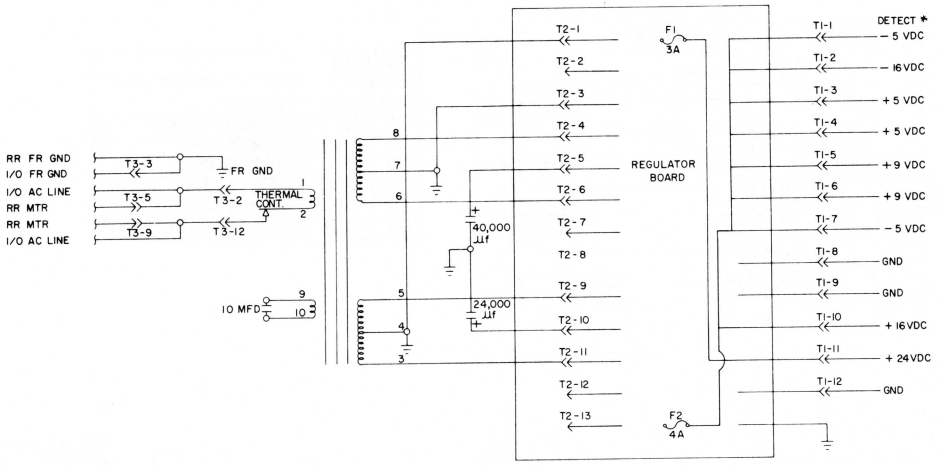
2. With the T-2 connector unplugged from the power supply board and the power on, if the voltage readings are incorrect the power supply chassis assembly should be replaced.

   a. 300VAC scale — 55VAC ± 10% between pin 9 and pin 11.
   b. 60VAC scale — **35VAC** ± 10% between pin 4 and pin 6.

POWER SUPPLY BOARD OUTPUT

3. With the T-1 connector unplugged short pin 7 to pin 1 (female connector) with a jumper. If any of the voltages are incorrect and the fuses and transformer outputs are good the power supply board should be replaced.

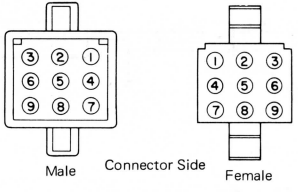
   a. 30VDC scale — 5VDC ± 10% between ground and pin 3.
   b. 30VDC scale — 5VDC ± 10% between ground and pin 4.
   c. 30VDC scale — 9VDC ± 10% between ground and pin 6.
   d. 30VDC scale — 16VDC ± 10% between ground and pin 10.
   e. 30VDC scale — 24VDC ± 10% between ground and pin 11.
   f. 12VDC scale — (-3.5 to -5.5)VDC between ground and pins 1 and 7.

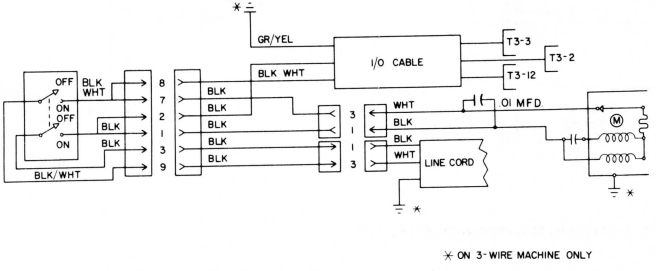


*Pins 57 & 69 connected on Planar Board

NOTE: Wiring between fuses and voltages is simplified board components.

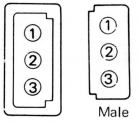
A.C. LINE CONNECTOR IN PRINTER

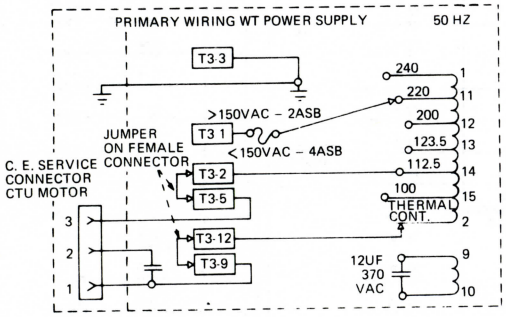




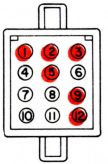
* ON 3-WIRE MACHINE ONLY

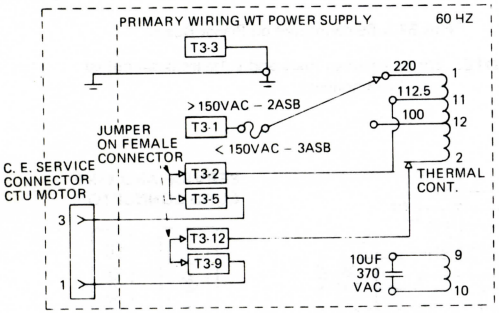
SERVICE AND LINE CORD CONNECTOR

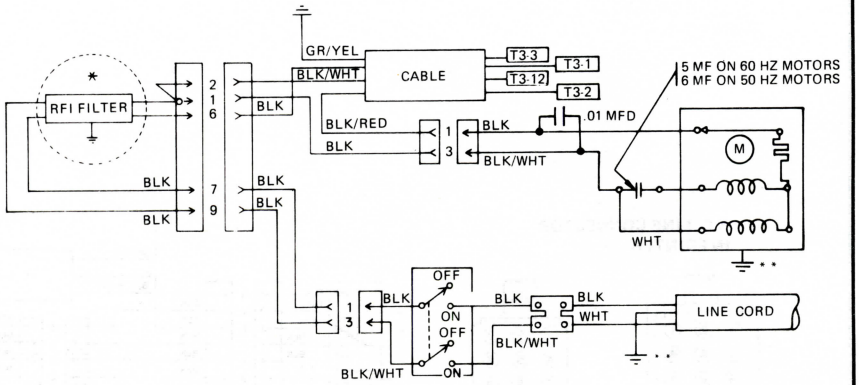




T3 CONN		
PIN	WIRE	NAME
1	73	I/O AC line (Black)
2	121,76	I/O MTR RUN
3	77	I/O FR GND
5	76	RR MTR RUN
9	75	RR MTR COM
12	74,75	I/O AC COM (BLK/WHT)







* ONLY TRUE FOR PRINTERS EQUIPPED WITH RFI FILTER

** On 3 Wire Machine Only

WT PIN JUMPER CHART MC82/96, MC80/90 AND MEM/T(88/96)

88-CHARACTER (88 CHARACTER PLANAR)

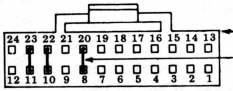
COUNTRY	KEYBOARD CODE	24	23	22	21	20	19	18	17	16	15	14	13
		12	11	10	9	8	7	6	5	4	3	2	1
BRAZIL	971		X	X		X							
BULGARIA	364	X	X										
CANADA FRENCH	493	X		X	X	X							
CZECHOSLOVAKIA	491					X		X					
DENMARK	987			X		X							
FRANCE/BELGIUM	983			X				X					
FRENCH ENGLISH US	057	X		X	X								
GERMANY/AUSTRIA	982	X	X	X	X								
GREECE	693		X			X							
HUNGARY	992			X	X								
ICELAND	695		X										
ITALY	985	X		X				X					
JAPAN LATIN	698	X	X		X								
JAPAN KATAKANA LATIN	699	X	X		X			X		X			
JAPAN KATAKANA PURE	368	X			X								
NETHERLANDS/S.A.	991		X	X	X	X							
NORWAY	988	X		X		X							
POLAND	499	X	X			X							
PORTUGAL	994, 995	X	X	X		X							
LATIN AMERICA	002, 948	X	X		X	X							
ROMANIA	489		X	X	X								
USSR	386	X											
SPAIN	970		X		X	X							
SWEDEN/FINLAND	986		X	X									
SWISS FRENCH	989				X								
SWISS GERMAN	990				X	X							
TURKEY	390	X	X	X						X			
UNITED KINGDOM	984	X			X	X							
YUGOSLAVIA	490			X	X	X							
9 CHARACTER ADJUST ZONE (6 CHAR. WITHOUT JUMPER)									X				
INHIBITS CORRECTING RIBBON MECHANISM (FOR FABRIC RIBBON)												X	
DECIMAL ", "OR", "USED IN UC (LC WITHOUT JUMPER)										X			
NUMERALS IN UC (IN LC WITHOUT JUMPER)								X					

96 CHARACTER – Old Arrangement (88 CHARACTER PLANAR)

COUNTRY	KEYBOARD CODE	24	23	22	21	20	19	18	17	16	15	14	13
		12	11	10	9	8	7	6	5	4	3	2	1
GERMANY/AUSTRIA	393	X		X	X		X						
JAPAN–ENGLISH	394						X						
JAPAN–KATA./ENG.	395	X					X						

96-CHARACTER Re-Arrangement

DENMARK	475	X	X			X							
FRANCE	605		X		X	X							
GERMANY/AUSTRIA	393/430		X			X							
ITALY	608			X			X						
JAPAN – ENGLISH	394/483												
JAPAN – KATANA	439/500,395/484	X		X			X		X				
NETHERLANDS	612	X	X		X	X							
NORWAY	474	X	X			X							
SPAIN	609	X				X							
SWEDEN/FINLAND	440	X	X			X							
SWITZERLAND FRENCH	555			X	X								
SWITZERLAND GERMAN	554			X	X								
UNITED KINGDOM	604	X		X	X								



TYPICAL EXAMPLE FOR KEYBOARD NO. 971 FOR MEM./T-THIS CONNECTOR PLUGS INTO PLANAR SOCKET 8.

MCC, MCII, MC/A
BOARD ZERO AND MAGNETIC HEAD TEST PROCEDURE

Resistance

1. With power off, unplug the read and record head leads. If the head resistance readings are incorrect, the magnetic head should be replaced.

Read Head

a. Rx1K Scale — No continuity between the yellow lead and any of the other leads.
b. Rx1 Scale — 25-35 ohms between the red and black leads
c. Rx1 Scale — 10-20 ohms between the red and white leads
d. Rx1 Scale — 10-20 ohms between the black and white leads

Record Head

a. Rx1K Scale — No continuity between the yellow lead and any of the other leads.
b. Rx1 Scale — .5-3 ohms between the red and white leads

Inputs

2. With board zero unplugged from its connector, check the following input voltages with power on. If any of the following voltage levels are incorrect, check the cable, power supply and planar package.

9 VDC between pin 38 and ground
5 VDC between pin 40 and ground
5.6-9.3 VDC between pin 32 and ground
2.4-5.5 VDC between pin 34 and ground
2.4-5.5 VDC between pin 36 and ground

Static Readings

3. With board zero plugged back in and head leads connected, check the following voltages. If any of the voltage levels read incorrectly, board zero is defective and should be replaced.

Record Head

a. 8.5-9.3 VDC between red lead and ground.
b. 8.5-9.3 VDC between white lead and ground

Read Head

a. 4.1-4.8 VDC between red lead and ground
b. 4.1-4.8 VDC between white lead and ground
c. 4.1-4.8 VDC between black lead and ground

Board Zero Connector

a. 4.1-4.8 VDC between pin 8 and ground
b. 4.1-4.8 VDC between pin 3 and ground
c. 0-.2 VDC between pin 25 and ground
d. 0-.2 VDC between pin 30 and ground
*e. 4.2V between pin 28 and ground

Install a jumper between pins 17 and 18 on the board zero connector before making the following check.

Record Head

a. 0-.6 VDC between red lead and ground
b. 0-.6 VDC between white lead and ground

Remove Jumper

*Note: Cannot Be Measured Accurately With Triplett Meter, But Voltage Should Not Read Either 0 or 8.5 VDC.

MAG CARD II, MC/A, MCC HEAD ALIGNMENT PROCEDURE

1. When the head is first installed in the machine, the pitch adjusting screw should be centered in its range, then the head mounting screws loosened and the head pushed down flat against the magnetic card, and the set screw tightened. This gives a preliminary pitch alignment which should be close enough to allow the head output to be read and adjusted.

2. Set the meter to the 3 VAC scale and connect the meter leads to test pins 3 and 8 on the board 0 plug.

3. Position the head alignment switch to the align position and insert the alignment card in the single card slot.

4. (PRELIMINARY) With the head in any track between 7 and 40, adjust head roll and pitch for maximum signal.

5. (PRELIMINARY) Move the head to track 3 and adjust the head across the card for maximum signal.

6. Move the head to track 5 and, using the screwdriver slot, adjust the head skew for maximum signal.

7. Check the head signal in tracks 1, 25 and 50 and adjust the head roll for minimum signal differences between tracks.

8. Move the head to track 25 and adjust the pitch adjusting screw for maximum signal then turn the screw CLOCKWISE until the signal JUST starts to fade.

9. Move the head to track 3 and carefully readjust the head across the card for maximum signal.

10. Position the head alignment switch to its normal position and remove the alignment card.

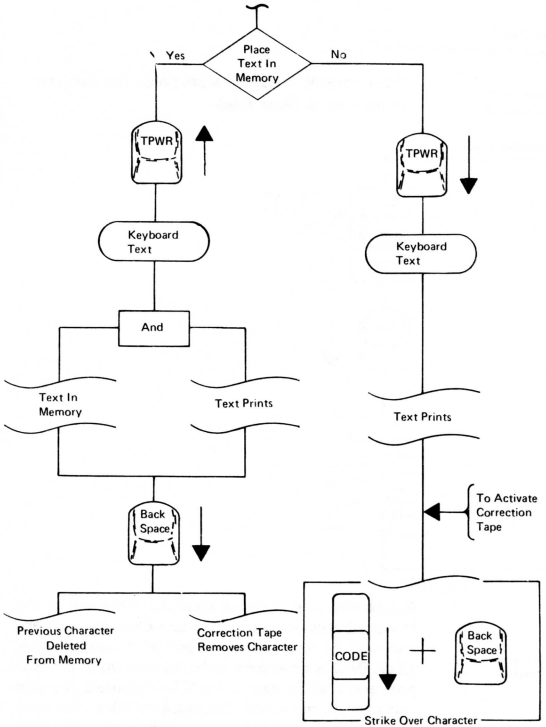
11. Enter approximately 40 Carrier Return Codes into memory (typewriter button up). Using a magnet, erase all recorded information from an EXTRA card. Latch the typewriter button down and depress Record. Insert the extra card in the single card slot. The machine will record a dummy character and a Carrier Return Code in approximately the first 40 tracks.

12. Develop the card and, using the alignment template, check the dummy character for correct front to rear position on the card.

13. If the dummy character position is incorrect, loosen the small set screw in the side of the head carrier and adjust the screw in the rear of the head carriage to correct the dummy position.

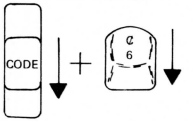
14. When rechecking dummy character position, make certain to erase the old information from the card. Depress Record and insert the card. Carrier Returns were retained with the typewriter button down.

TO KEYBOARD TEXT



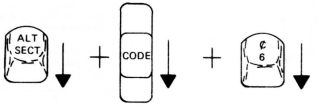
NOTE: Centering, word underscore and dec. tab are not operative when the TPWR button is down.

TO CLEAR MEMORY:

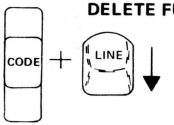


Set Tabs, Line Length, & Line Count Not Changed

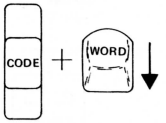
TO CLEAR ALTERNATE SECTION OF MEMORY, MC II



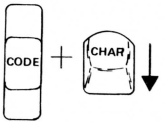
DELETE FUNCTIONS



Deletes A Line Of Text. If The Memory Is Positioned In The Middle Of A Line, The Text Remaining In That Line And The Carrier Return Will Be Deleted.



Deletes A Word Or Function Code. (When Deleting A Word, The Function Code Following The Word Is Also Deleted.)



Deletes A Character Or Function Code.

WORKING WITH MEMORY

Backspace With 

Deletes Text.

(Function Codes, With The Exception Of Carrier Return, Required Carrier Return, Index And Index Return, Can Be Deleted By Backspacing Over The Code.)



Rearranges Line Endings In Memory During Playout.

ACCESS BUTTONS



Return To Previous Page End Code In Memory. If There Are No Page End Codes, Return To The Beginning Of Text.



Advance Memory To Beginning Of Next Paragraph.*



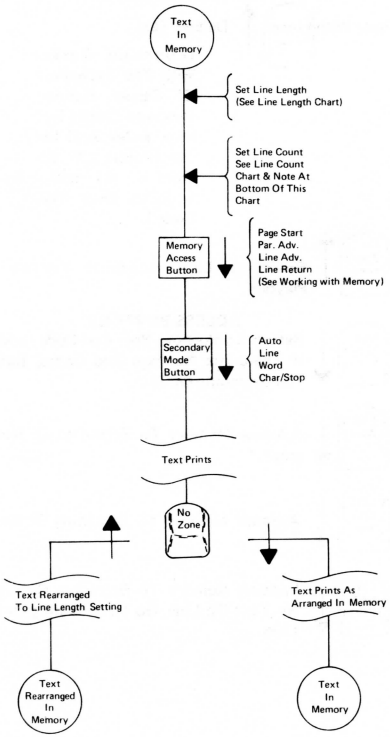
Advance Memory To Beginning Of Next Line.



Position Memory To Beginning Of Line Or If No Text On Line, Go To Beginning Of Previous Line.

* Paragraph Identification —
2 or More Carrier Returns
Carrier Return / Tab
Carrier Return / Space
Required Carrier Return
Index Return

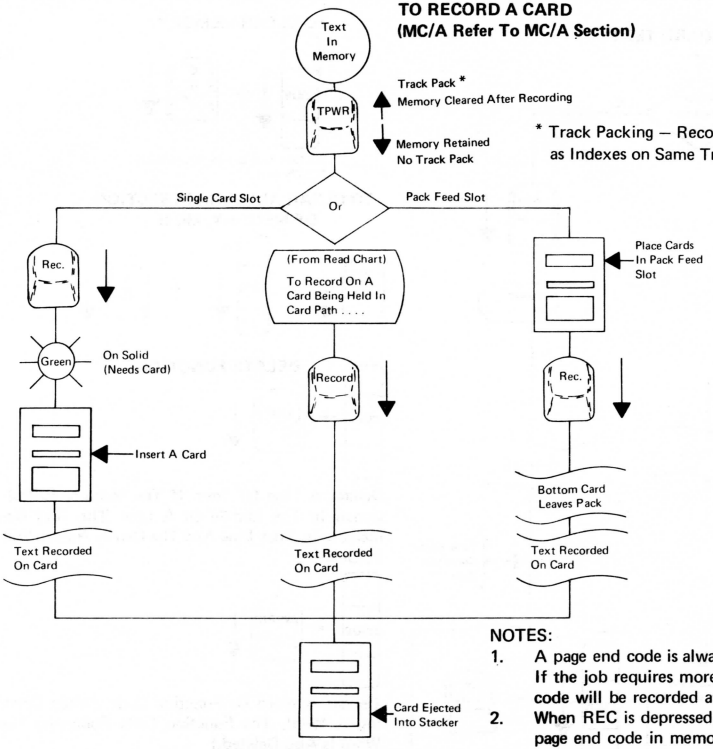
PLAYBACK



NOTES:

1. Carrier must be at left margin when pitch lever is changed.
2. When playing back scanned text, line count must be zero/zero to ensure all text will playback.
3. With no zone up machine may stop for hyphenation decisions.

TO RECORD A CARD
(MC/A Refer To MC/A Section)



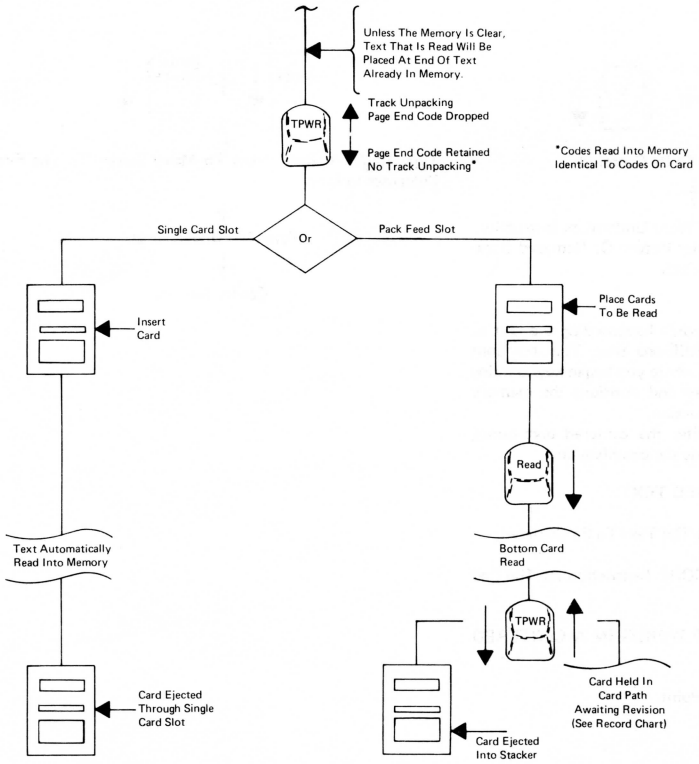
* Track Packing — Record Multiple Carrier Returns as Indexes on Same Track

NOTES:

1. A page end code is always recorded at the end of job. If the job requires more than one card, the page end code will be recorded at the end of the second card.
2. When REC is depressed, only the text up to the next page end code in memory will be recorded. If a page end code is not found, the machine thinks the complete memory is a page and records a page end code at the end of text.
3. If the read mode is determined through the pack feed slot, cards can only be recorded through the single card slot until the memory is cleared.
4. Text cannot be recorded out of the alternate section of memory.

TO READ A CARD

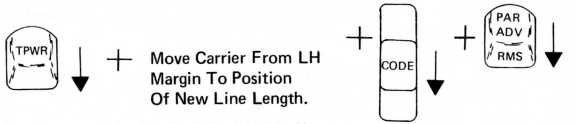
(MC/A Refer To MC/A Section)



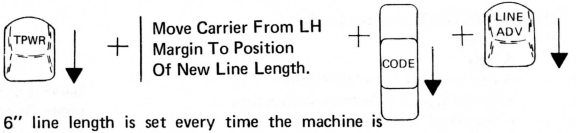
NOTE: If the READ mode is determined in the single card slot, cards cannot be read through the PACK FEED SLOT until the memory is cleared.

LINE LENGTH

TO SET LINE LENGTH FOR PLAYOUT & HYPHEN SCAN:



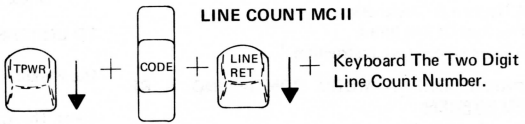
TO SET LINE LENGTH FOR NO HYPHEN SCAN:



NOTES:

1. A 6" line length is set every time the machine is turned on. This line length is set for hyphen scan.
2. If the left margin setting is changed, the 6" line length will be maintained, and moved with the left margin setting.
3. If the pitch lever is moved, with the carrier away from the left margin, during playout, that line of print will be extended by the distance the carrier is from the left margin.

LINE COUNT MC II

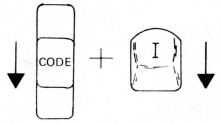


NOTES:

1. Line count stops playout or scan when the index count equals the line count. (See Scan Chart for examples.)
2. The line count must consist of a two digit number, even if the first number is a zero. The line count must not go above 95.
3. To remove an unwanted line count, simply enter a zero/zero line count.
4. A zero-zero line count comes up when the power is turned on.
5. Clearing the memory from the keyboard does not change line count.

WORD UNDERSCORE

Type The Word To Be Underscored.



The Machine Will Backspace Until It Finds:
- A Space
- A Tab
- A Carrier Return, Index Return
- Another Word Underscore Instruction
- A Required Backspace

TO UNDERSCORE SEVERAL WORDS

Type The Text To Be Underscored Using Required Spaces — then Follow The Instructions For Word Underscore.

TO UNDERSCORE A WORD THAT IS SEPARATED AT THE END OF A LINE:

Type The First Part Of The Word.
Type A Word Underscore Instruction.
Type A Hyphen & Carrier Return.
Type The Rest Of The Word.
Type A Word Underscore Instruction.

TO UNDERSCORE A WORD CONTAINING A REQUIRED HYPHEN:

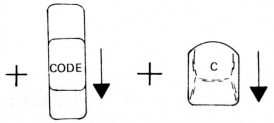
Type The First Word.
Type A Word Underscore Instruction.
Type The Required Hyphen.
Type The Next Word.
Type Another Word Underscore Instruction.

WHEN PLAYBACK STOPS FOR HYPHENATION OF AN UNDERSCORED WORD:

Play By CHAR To The End Of A Syllable.
Type A Word Underscore Instruction. (The Machine Will Underscore The First Part Of The Word.)
Type A Hyphen.
Depress AUTO.

TO CENTER

Tab Or Space To Point Which Text Will Be Centered Around.



Keyboard Text To Be Centered

+

Depress Carrier Return, Tab, Word Underscore Instruction, Index Return, Required Carrier Return Or Required Backspace To Print The Centered Text.

NOTES:
1. If you make an error while keyboarding the text to be centered, BACKSPACE one time. This positions the carrier to the point where you began keyboarding the text to be centered and positions the memory back to the center instruction.
2. To correct an error after the centered text prints, delete the line and retype the complete line.

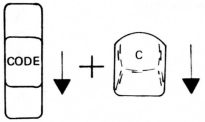
TO UNDERSCORE CENTERED TEXT:

Use Required Spaces To Type The Text To Be Centered.

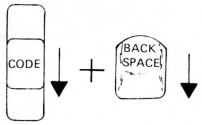
Enter The WORD UNDERSCORE Instruction At The End Of The Last Centered Word.

TO UNDERSCORE SINGLE WORDS IN A CENTERED LINE:

Tab Or Space To The Center Point.



Type The Text To Be Centered.



Type Required Backspaces To Move Carrier To The First Character In Line.

+

Type The Underscores.

+

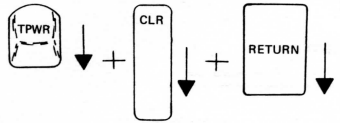
Carrier Return.

TAB

Tabs Are Automatically Set Every 5 Spaces When Power Is Turned On.

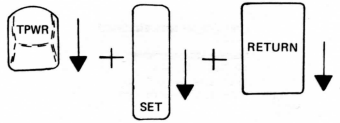
Single Tab Stops Can Be Set And Cleared Just As On A "Selectric" Typewriter.

TO CLR ALL SET TABS:



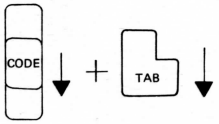
Clears All Set Tabs Even If Carrier Is At The Left Margin.

TO RESET 5 SPACE TABS:

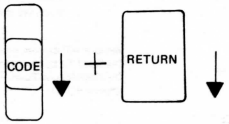


REQUIRED TABS
(Paragraph Indent)

(TO ENTER A REQUIRED TAB)



TO CANCEL THE REQUIRED TAB INSTRUCTION:



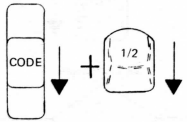
NOTES:

1. The system can allow for up to 14 required tabs per line.
2. Required tabs must be used if indented text will be played back with NO ZONE up.

DECIMAL TAB



TO ENSURE PROPER PLAYOUT:



= A DECIMAL TAB OPERATION

Carrier Will B/S One Time For Each Figure Keyboarded Until The Decimal Point Is Typed.

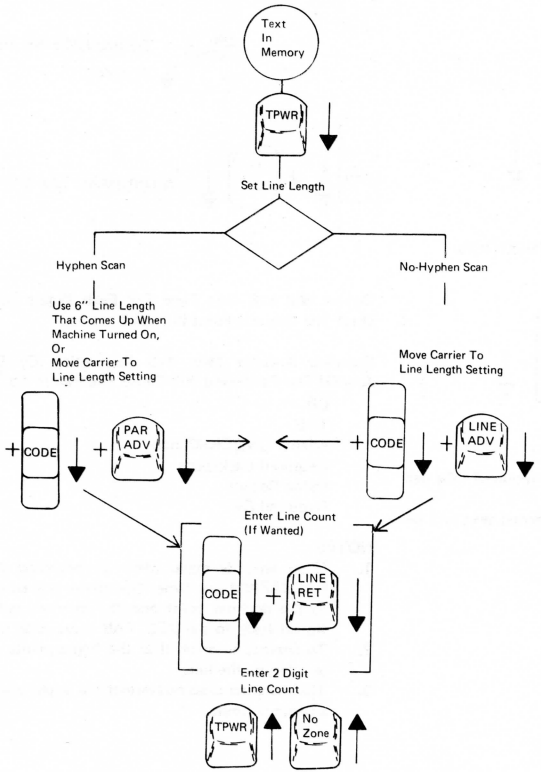
Entering Another Dec. Tab Instruction Or Depressing Any Of The Following Will Cause The Figure To Print:

- CR
- TAB
- WORD UNDERSCORE
- Required Backspace
- Index Return
- Required CR

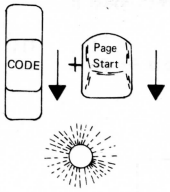
NOTES:

1. If an error is made while keyboarding the figures, BACKSPACE one time. The carrier will be positioned to the decimal point and the memory will be positioned back to the DEC. TAB instruction in memory.
2. To correct an error after the figure prints, line delete and retype the line.
3. The machine does not detect the upper case period as a decimal point.

TO SCAN TEXT



Begin Scanning Text



Hyphen Scan

Prints Line No. And Word To Be Hyphenated. Splits Word With a Space

Memory Will Be Positioned At The Beginning Of The Word To Be Hyphenated. Depress CHAR To The Hpyhenation Point, Type A Hyphen And Depress AUTO

Or

The Complete Word Can Be Placed On The Same Line By Depressing AUTO

Or

The Complete Word Can Be Placed On The Next Line By Depressing Carrier Return

LINE COUNT ENTERED

Machine Will Stop When Line Count Reached & Print Line Count And Last Line Of Text SCANNED.

When There Is Not Enough Text To Satisfy The Line Count, The Number Which Prints Indicates The Number Of Lines Of Text In Memory. Depress CODE And PAGE START To Record The Remaining Text Or Read Additional Text Of The Job And Continue Scanning

LINE COUNT NOT ENTERED

Final Number Which Prints Is Total Lines Of SCANNED Text. Depress CODE & PAGE START To Record The Remaining Text.

No Hyphen Scan

LINE COUNT ENTERED

Machine Will Stop When Line Count Is Reached, And Prints Last Line. To Continue SCAN And Record The Scanned Text, Depress CODE & PAGE START.

LINE COUNT NOT ENTERED

Machine Will Stop When All Text Is Scanned. The Number Which Prints Is The Total Lines Of Text.

NOTES:

1. If there is a card in the single card slot, machine will not SCAN.
2. Enter SCAN instruction with no text in memory — 01 will print. At this point, the memory can be cleared.
3. A page end code or stop code in text will stop SCAN. If a page end code is reached before the line count is reached and REC is depressed, the text up to and including the page end code will be recorded.
4. If a page end code comes before the text in memory and the SCAN instruction is entered, the machine will print 01. The page end code should be removed before the text is scanned.
5. Playback of scanned text must always be with a no zone down and 00 line count to ensure that all text will print-out as scanned.

The following examples are based on the text as shown here:

```
Product Evaluation on Line is a division of Product Testing, whose primary
function is to audit product machines for quality.  By sampling the finished
product and applying a functional check and short robot run on a daily basis,
quality and parts problems information can be fed to the assembly departments
for correction.  The close proximity of this function to assembly provides
fast feedback and minimizes costly reworks on the line and in the field.

Product Evaluation's second function is to report machine performance in the
field on a long term basis; that is, through the warranty and maintenance
period.  This is accomplished by analyzing CE reports from reporting offices
over the country.  The purpose is to measure the product performance against
an established service criterion and to identify high service components and
systems for possible machine improvement action.
```

6. The machine will NOT stop scanning on next to the last line of a paragraph and will print the last line of the paragraph as the reference line.

EXAMPLE: Line Length = 3" Line Count = 16

Reference Playout →
```
12  proximi ty  proxi-
14  feedbac k  feed-
17
field.
```

THE MEMORY LOOKS LIKE THIS AFTER THE FIRST SCAN OPERATION

```
Product Evaluation on Line is
a division of Product Testing,
whose primary function is to
audit product machines for
quality.  By sampling the
finished product and applying
a functional check and short
robot run on a daily basis,
quality and parts problems
information can be fed to the
assembly departments for
correction.  The close proxi-
mity of this function to
assembly provides fast feed-
back and minimizes costly
reworks on the line and in the
field.
```
} Scanned Text

Line 16 →

This last line of the first paragraph IS scanned.

7. The machine will not scan into the first line of a new paragraph and will print the last line of the previous paragraph as the reference line.

EXAMPLE: Line Length = 3" Line Count = 19

Reference Playout →
```
12  proximi ty  proxi-
14  feedbac k  feed-
17
field.
```

THE MEMORY LOOKS LIKE THIS AFTER THE FIRST SCAN OPERATION

```
Product Evaluation on Line is
a division of Product Testing,
whose primary function is to
audit product machines for
quality.  By sampling the
finished product and applying
a functional check and short
robot run on a daily basis,
quality and parts problems
information can be fed to the
assembly departments for
correction.  The close proxi-
mity of this function to
assembly provides fast feed-
back and minimizes costly
reworks on the line and in the
field.
```
} Scanned Text

Line 19 →

This first line of the second paragraph is NOT scanned.

```
Product Evaluation's second function is to report machine performance in the
field on a long term basis; that is, through the warranty and maintenance
period.  This is accomplished by analyzing CE reports from reporting offices
over the country.  The purpose is to measure the product performance against
an established service criterion and to identify high service components and
systems for possible machine improvement action.
```

8. If the line count is reached on a carrier return between paragraphs, the previous line will print as the reference line. The page end code will be inserted after the carrier return.

EXAMPLE: Line Length = 3" Line Count = 18

Reference Playout →
```
12  proximi ty  proxi-
14  feedbac k  feed-
17
field.
```

THE MEMORY LOOKS LIKE THIS AFTER THE FIRST SCAN OPERATION

```
Product Evaluation on Line is
a division of Product Testing,
whose primary function is to
audit product machines for
quality.  By sampling the
finished product and applying
a functional check and short
robot run on a daily basis,
quality and parts problems
information can be fed to the
assembly departments for
correction.  The close proxi-
mity of this function to
assembly provides fast feed-
back and minimizes costly
reworks on the line and in the
field.
```
} Scanned Text

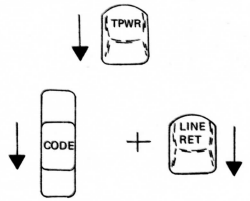
Line 18 →

```
Product Evaluation's second function is to report machine performance in the
field on a long term basis; that is, through the warranty and maintenance
period.  This is accomplished by analyzing CE reports from reporting offices
over the country.  The purpose is to measure the product performance against
an established service criterion and to identify high service components and
systems for possible machine improvement action.
```

UNATTENDED PRINTING

The Operator Must Use Continuous Paper.
The Machine Plays Text From Previously Recorded Cards Placed In The Pack Feed Slot.

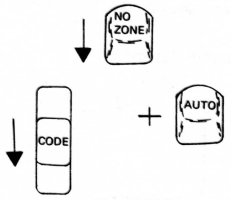
(Enter Line Count)



Keyboard — 2 Digit Line Count

(For Standard Paper — Enter A Line Count of 33 For Double Spacing; 66 For Single Spacing)

Position Paper To Where First Line Is To Be Typed.



Machine Will Automatically Perform The Following:
- Read The First Page Into Memory
- Eject The Card Into The Stacker
- Playout To The End Of Text
- Index The Paper To The Start Of The Next Page
- Clear The Memory
- Read The Next Page Into Memory

TO INTERRUPT UNATTENDED PRINTING:

Depress LINE, WORD Or CHAR/STOP.

TO RESTART UNATTENDED PRINTING:

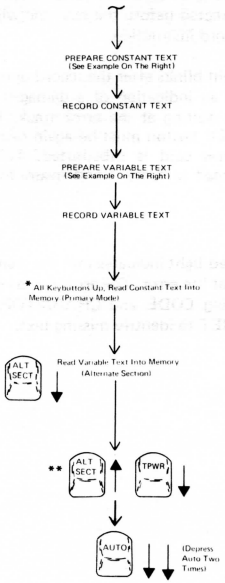
Depress CODE And AUTO If No Keyboarding Has Been Done.

TO STOP AT THE END OF A PAGE:

Wait Until The Page Starts To Playback.
Remove The Cards From The Pack Feed Slot.
The Machine Will Play Back The Page; Index To The Next Page And Stop.
The Memory Is Cleared Automatically.

NOTES:
1. The machine will automatically index to the next page when a page end code is read.
2. By placing SWITCH CODES on the cards, variable information can be read into ALTERNATE SECTION for unattended print-out.
3. Applications requiring element changes or different line spacing in the same document are not suggested for unattended printing since stop codes are not noticed.

ALTERNATE SECTION



STOP CODE

February 23, 1973

SWITCH CODE

Dear Stockholder;

A dividend of $1.25 has been credited to your account for each $100.00 you have on deposit with us, as of today's date.

Your Home Town Savings

REPEAT CODE

February 23, 1973

j

Dear Stockholder;

A dividend of $1.25 has been credited to your account for each $100.00 you have on deposit with us, as of today's date.

Your Home Town Savings

Note that a "j" printed when the SWITCH CODE was entered.

Example Of Constant Text, Prepared For Use With Alternate Section

Mr. John Smith
1234 South Street
Any Town, State

Mr. John Brown
5678 North Street
Any Town, State

Mr. Jim Hill
9012 East Street
Any Town, State

Mr. John Smith
1234 South Street
Any Town, State j

Mr. John Brown
5678 North Street
Any Town, State j

Mr. Jim Hill
9012 East Street
Any Town, State j

Note that a "j" printed when the SWITCH CODE was entered.

Example Of Variable Text, Prepared For Use With Alternate Section

NOTES:

*If the operator wants to read the variable text through the pack feed slot, the constant text must also be read through the pack feed slot.

** ALT SECT must be up and TPWR must be down before playout begins.

1. If the TPWR button is up during playout, switch codes will print as "j"s.
2. If there is more than one card of variable text, read the additional cards in the following manner:

   Depress ALT SECT
   Type a CLR instruction
   Read the next card of variable text
   Release ALT SECT
   Depress AUTO

LIGHT/ERROR CONDITIONS

GREEN LIGHT


BLINKING

Remove card from single card slot as the machine must read another card. When a job is too large to be recorded on one card, the machine will place the page end code at the end of the job on the second card. When the first card is read back into memory, a page end code will not be found and the machine will eject the card through the single card slot and the green light will blink. If there is another card (the second card of the job) in the pack feed slot, it will be fed into the card path automatically and the text read into memory.


SOLID

The machine needs a card to record on!

YELLOW LIGHT

During a READ operation, the memory can not hold all the text on the card.


"BLINKING"

The card will be ejected through the single card slot. None of the text will be read into memory.

NOTE: The yellow light will blink at a high rate during a SCAN operation.


SOLID

Memory is full.

RED LIGHT

(An error has been detected.)


RED BLINKING

DURING A READ OPERATION

If the red light blinks on the first effort to read the card, an error has been detected. The card should be cleaned and reinserted.

When the card is inserted the second time, one of the following will occur:

1. The machine will continue to read the card normally. This is a "format" error and the error has been placed in memory. The text following the error is unchanged in memory.
2. The read operation will end immediately – the card will be ejected and the head will return to Track 1. This is a "no-data-found" error. The text following the error will not be read from the card and is lost.

TO RECOVER TEXT FOLLOWING A NO-DATA-FOUND ERROR:

Clear the memory.
Insert the card as usual and wait for the red light to blink.
Reinsert the card, but HOLD THE CODE KEY DEPRESSED. The machine will read the track up to the error, track step up, and read the following tracks. The text on the track beyond the error cannot be recovered and must be rekeyboarded.

DURING A RECORD OPERATION


RED BLINKING

If the red light blinks as soon as record is depressed, there is an error in memory. The error must be corrected before the machine will perform the record instruction.

If the red light blinks after the record operation begins, it is an indication of a damaged card. The head is waiting at the error track. Therefore, the REC button must be again depressed before a new card is substituted. This will return the head to Track 1 and ensure full text recording.


SOLID RED LIGHT

The solid red light indicates that the memory is positioned at the error. The error can be cleared by depressing CODE and CHAR/STOP. Then use LINE RET to identify missing text.

FORMAT FEATURE MCII, MC/A

The format feature allows an operator to enter certain playback instructions within text. Instructions for typewriter adjustments such as linespacing, line length, adjust or no zone, and tabs, once typed, are contained on a line in memory — a format line. This format line can be recorded on a magnetic card either alone or as part of the text.

During playback, the format line instructions cause these typewriter adjustments to be made automatically without operator interference.

A format line is always typed at the left margin. An index return (code index) or a required carrier return (code carrier return must precede the format line. Once either of these has been entered, a format line is started with a begin format instruction.

When a begin format instruction is typed, nothing will print on the paper, but the carrier will space and backspace once, which is called a "dummy cycle." This "dummy cycle" is an indication that the format line instruction has been entered correctly. (This dummy cycle is called a "thump" in the operator's instruction manual.)

The recorded information within a format line is compatible between Mag Card II and Mag Card/A typewriters equipped with the format feature. If this information is read on any mag keyboard without the format feature, the electronics will read the information as a stop code.

If an operator is using an IBM Mag Card II Typewriter equipped with the format feature, a line count can be entered and text scanned without regard for single or double linespacing changes throughout the text.

If a format line is recorded out of memory (REC) or cleared out of memory (CODE + 6), the format instructions existing are accumulated and then become the standards for the printer.

INVALID FORMAT LINES

An invalid format line is one that has an incorrect code within the format line or a correct format line that is not preceded by a Required Carrier Return or an Index Return.

A double hyphen will print if one of these format lines is played out, and playout will stop. If one of these format lines is skipped over in memory by ACCESSING, the next attempt to playout will cause a double hyphen to print and playout will stop indicating that an invalid format line exists.

If an incorrect character is entered while keying a format line, the incorrect character and a hyphen will print and be entered into memory. These characters can be error correct backspaced out of memory.

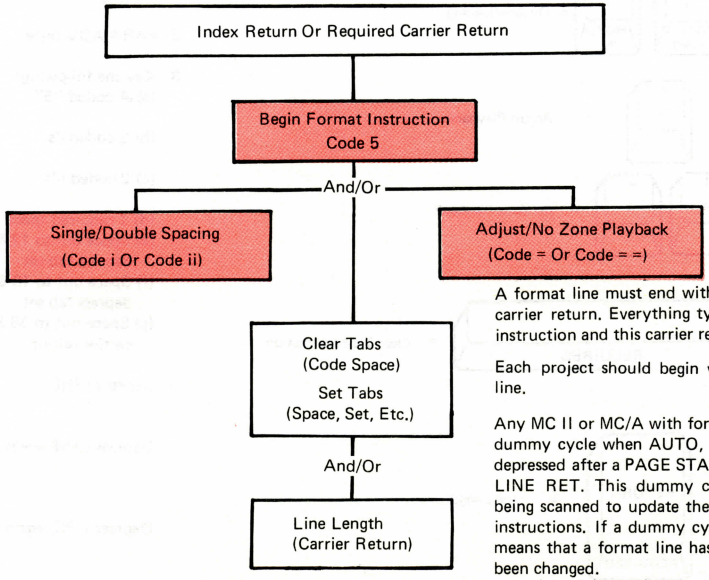
COMPLETE FORMAT LINE

The chart shows:

1. All of the possible formatting instructions that can be contained in a complete format line.
2. The correct sequence to enter the desired instructions.

The instructions in the shaded area:

1. Are nonescaping (the carrier does not move away from the left margin).
2. Are to be entered before changing tabs or line length.

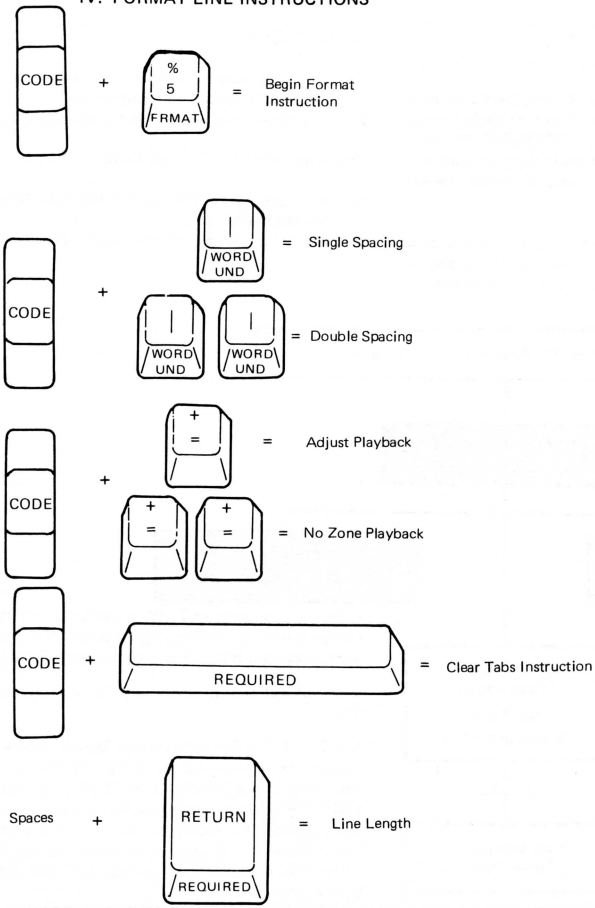


A format line must end with a carrier return or a required carrier return. Everything typed between the begin format instruction and this carrier return is nonprinting.

Each project should begin with its own complete format line.

Any MC II or MC/A with format feature installed will give a dummy cycle when AUTO, LINE, WORD, CHAR/STOP is depressed after a PAGE START, PAR ADV, LINE ADV, or LINE RET. This dummy cycle indicates that memory is being scanned to update the machine to the proper format instructions. If a dummy cycle occurs during playout, this means that a format line has been read and the format has been changed.

IV. FORMAT LINE INSTRUCTIONS



V. FORMAT FEATURE "QUICK CHECK"

(PERFORM EACH STEP IN SEQUENCE – EXACTLY AS INSTRUCTED)

NOTE: ALL CHECKS PERFORMED IN 12 PITCH MODE LEGAL OR TWO SHEETS OF PAPER LENGTHWISE TO COVER PLATEN, SINGLE INDEX MODE, AND MARGIN AND CARRIER AT ZERO.

The "Quick Check" is an abbreviated test of the format feature logic. For a complete diagnostic aid, the "Functional Test" should be used.

CHECK PROCEDURE	MACHINE RESPONSE	INDICATION
1. All buttons up. "Power on." Read test card no. 01 in the single card slot.	Card is read and ejected through single slot.	Text in memory
2. PARA ADV once	Carrier returns	
3. Key the following:		
(a) A coded "5"	Dummy cycle	Format instruction in memory
(b) 2 coded i's	Dummy cycle twice	Double indexing instruction in memory
(c) 2 coded ='s	Dummy cycle twice	Adjust off instruction in memory
(d) 1 required space	Spaces once	Clears tab grid
(e) Space out to 12 & depress tab set	Carrier spaces out; dummy cycle when tab stop is set	Tab set
(f) Space out to 18 & depress tab set	Same as above	Tab set
(g) Space out to 38 & carrier return	Carrier spaces out & carrier returns	Right margin set at 38
4. Depress LINE	A string of numbers prints in DOUBLE index mode	Double index OK
Depress LINE again	Line A prints beneath the underlined "2" (DOUBLE indexed)	Tab stop set at 12 OK
Depress LINE again	Line B prints beneath the underlined "8" (DOUBLE indexed)	Tab stop set at 18 OK; adjust off OK

CHECK PROCEDURE	MACHINE RESPONSE	INDICATION
5. PAGE START LINE ADV once	Carrier returns Dummy cycle	
6. Depress LINE	A dummy cycle followed by a "1" at the left margin and a "72" at the right margin; the carrier returns and then tabs to an indent level at "5." Printing stops.	Format transfer OK
7. Clear memory (coded "6")	Carrier returns	Memory cleared
8. Read card number 01 through single slot & REMOVE	Card is read and ejected through single slot	Text in memory
9. Depress LINE	A "1" prints at the left margin followed by a "33" at the right margin. This line should be SINGLE indexed.	Format update & transfer OK
10. PARA ADV 8 times	Carrier returns and dummy cycles 7 times	
11. Key a page end code	No response	
12. Record onto blank card	Card is recorded & stacked	Text up to the page end code is recorded and cleared from memory
13. Depress AUTO	Three text lines print: 1) Tabs and prints "REQ TAB" 2) A line of 9 t's prints at 2, 4, 6, 8, 128, 130, 132, 134 & 136 Both lines should be DOUBLE indexed 3) A dummy cycle followed by a "1" at the left margin & a "33" at the right margin (SINGLE indexed)	Memory cleared properly; format update & transfer OK Playout of format line OK; format change OK

CHECK PROCEDURE	MACHINE RESPONSE	INDICATION
14. Switch to 10 pitch; Power off/on; Read card no. 01 in single card slot & REMOVE	Card is read	Text in memory
15. LINE ADV twice	Carrier returns & dummy cycles	
Depress LINE	Tab to 5, dummy cycle, print a "1" followed by a "60" at the right margin. Carrier returns and tabs to an indent level at 5. Printing stops.	10 pitch playout OK
Key a required carrier return	Carrier returns to left margin	Indent level terminated
	SCAN TEST FOR F. F.	
16. Switch to 12 pitch; Power off/on; Read card no. 02 through single card slot & REMOVE	Card is read & ejected	Text in memory
17. TPWR button DOWN; enter line count of 09	"09" is printed and the carrier returns	Line count entered
TPWR button UP; Depress "SCAN"	Carrier returns, yellow light blinks, "08" prints, carrier returns, a dummy cycle, "SCAN 2" prints (SINGLE indexed)	Scanning text Scan of formatting instructions OK
18. TPWR button DOWN; PAGE START: Enter line count of 15	Carrier returns; "15" is printed & the carrier returns	Line count entered
TPWR button UP; Depress "SCAN"	Carrier returns, yellow light blinks, "13" prints, carrier returns, a dummy cycle, a tab, "SCAN 3" prints (DOUBLE indexed)	Scanning text Scan of formatting instructions OK
End of "Quick Check."		

VI. FORMAT FEATURE "FUNCTIONAL TEST"
(PERFORM EACH STEP IN SEQUENCE –
EXACTLY AS INSTRUCTED)
NOTE: ALL CHECKS PERFORMED IN 12 PITCH MODE
LEGAL OR TWO SHEETS OF PAPER LENGTHWISE
TO COVER PLATEN, SINGLE INDEX MODE,
AND MARGIN AND CARRIER AT ZERO.

The "Functional Test" is a complete check of the format feature logic.

All Buttons "UP" Power "OFF" Then Power "ON"

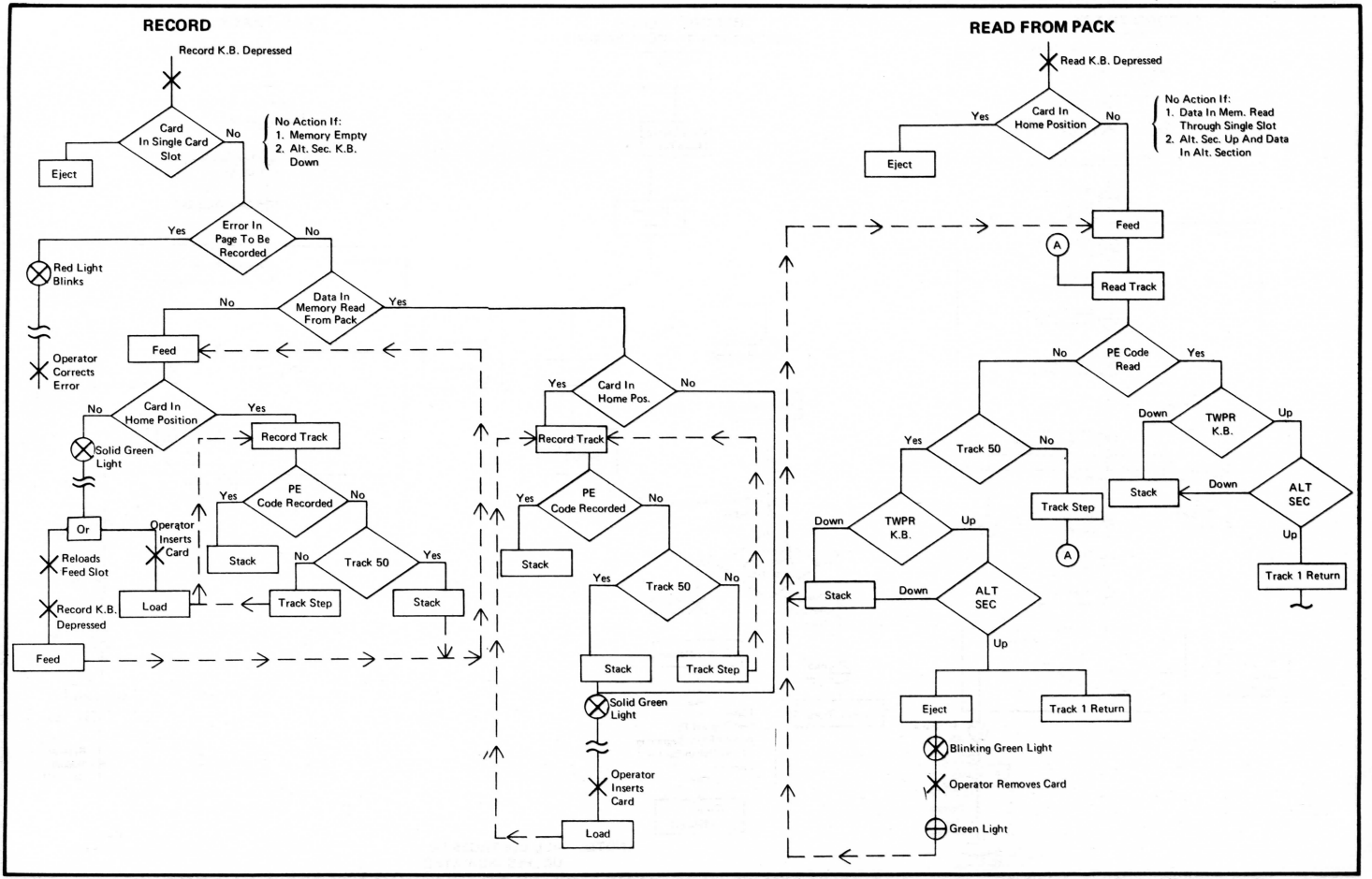
CHECK PROCEDURE	MACHINE RESPONSE	INDICATION
1. Read card 01 through single slot	Card is read & ejected through single slot	Text in memory
2. TPWR down; PARA ADV once	Carrier returns	
3. Key the following:		
(a) A coded "5"	No response	Format input inhibited in typewriter mode
(b) TPWR up; A coded "5"	Dummy cycle	Format instruction in memory
(c) 2 coded i's	Dummy cycle twice	Double indexing instruction in memory
(d) 2 code ='s	Dummy cycle twice	Adjust off instruction in memory
(e) 1 required space followed by 4 spaces	Spaces 5 times	Tab rack cleared
(f) PAGE START;	No response	Secondary modes ignored
AUTO	No response	in format input mode
(g) Depress tab set	Dummy cycle	Tab set
(h) 1 error backspace	Dummy cycle	Tab cleared
(i) Space out to 12 and depress tab set	Carrier spaces out; dummy cycle when tab stop is set	Tab set
Space out to 18 & depress tab set	Same as above	Tab set
(j) Space out to 38 & carrier return	Carrier spaces out & carrier returns	Right margin set at 38
4. Depress Auto	A string of numbers prints, followed by 3 TEXT lines (printing stops). Line A should start underneath the underlined "2" & line B underneath the underlined "8." All lines should be DOUBLE indexed.	Tab stops set at 12 & 18 are OK. Double index and adjust off are OK
5. Key the following:		
(a) A coded "5"	Dummy cycle	Format instruction in memory
(b) 1 coded "i"	Dummy cycle	Single index instruction in memory
(c) 1 coded =	Dummy cycle	Adjust on instruction in memory
(d) A coded "6"	A hyphen prints	Invalid entry recognized.
an error backspace	Erases hyphen	Hyphen deleted from memory
(e) Carrier return	Carrier returns	Format line terminated
6. Depress AUTO	Two TEXT lines print; line C should print directly underneath line B; line D should start under line A. Both lines should be SINGLE indexed.	Tab stops still set at 12 & 18 & right margin = 38. Adjust on and single index OK
7. PAGE START; PARA ADV 2 times	Carrier returns Dummy cycle twice	
8. Depress AUTO	Dummy cycle followed by the same response as step 4	Format update OK
9. PAGE START; LINE ADV once	Carrier returns Dummy cycle	
10. Depress LINE	A dummy cycle followed by a "1" at the left margin and a "72" at the right margin; the carrier returns then tabs to an indent level at 5. Printing stops	History transfer OK

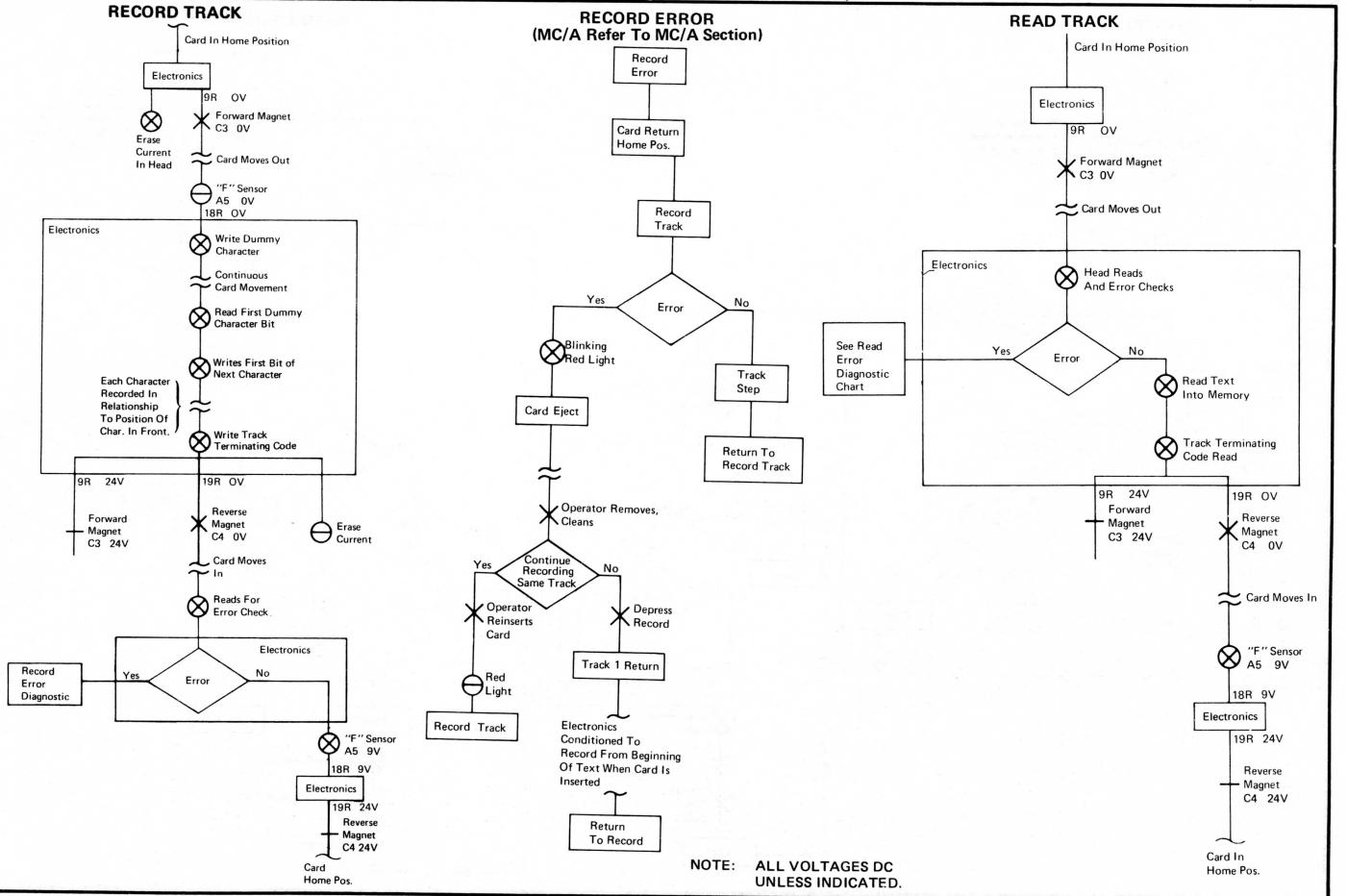
CHECK PROCEDURE	MACHINE RESPONSE	INDICATION
11. Clear memory (coded "6")	Carrier returns	Memory cleared
12. Read card 01 through single slot & REMOVE	Card is read & ejected through single card slot	Text in memory
13. Depress LINE	A "1" prints at the left margin followed by a 33 at the right margin. This line should be SINGLE indexed	Format update & transfer OK
14. PARA ADV 7 times	Carrier returns & dummy cycles 6 times	Flag addressing invalid format line
15. Depress AUTO	A dummy cycle & two hyphens play out; playback stops	Invalid format line recognized upon playout
16. LINE ADV once;	Carrier returns	Flag addressing second to last line in memory; recognition of accessing over invalid format line OK
depress CHAR/STOP	Tabs to 2, dummy cycles, & prints 2 hyphens	
17. Line Ret once	Carrier returns	
18. Key a page end code	No response	Page end code following invalid format line
19. Record onto blank card	Card is recorded & stacked	Text up to page end code is recorded & cleared from memory
20. Depress AUTO	Three text lines print: 1) Tabs and prints "REQ TAB" 2) A line of 9 t's print at 2, 4, 6, 8, 128, 130, 132, 134 & 136 Both lines should be DOUBLE indexed 3) A dummy cycle followed by a "1" at the left margin & a "33" at the right margin (SINGLE indexed)	Memory cleared properly; format update & transfer OK Playback of format line OK; single index, adjust on, tabs at 10, 20 & 30 and right margin = 33 OK.

CHECK PROCEDURE	MACHINE RESPONSE	INDICATION
21. Switch to 10 pitch; Power off/on read card 01	Card is read	Text in memory
22. LINE ADV twice;	Carrier returns & dummy cycles.	
Depress LINE	Tab to 5, dummy cycle, print a "1" followed by a "60" at the right margin. Carrier returns & tabs to an indent level at 5. Printing stops.	Standard tab rack & 6 inch right margin for 10 pitch set up in history buffer OK
	SCAN TEST FOR FORMAT FEATURE	
23. Switch to 12 pitch; power on/off; read card 02 through single card slot & REMOVE	Card is read & ejected	Text in memory
24. TPWR button DOWN. Enter a line count of 05.	"05" is printed & the carrier is returned	Line count entered
TPWR button UP. Depress "SCAN"	Carrier returns, yellow light blinks, "05" prints, carrier returns, dummy cycle, "SCAN 1" prints (DOUBLE indexed)	Scanning text; scan of double indexed text OK
25. TPWR button DOWN: PAGE START: Enter line count of 09.	Carrier returns "09" is printed & the carrier is returned	Line count entered
TPWR button UP. Depress "SCAN"	Carrier returns, yellow light blinks, "08" prints,	Scanning text; scan of formatting
	carrier returns, dummy cycle, "SCAN 2" prints (SINGLE indexed)	parameters OK

CHECK PROCEDURE	MACHINE RESPONSE	INDICATION
26. TPWR button DOWN; PAGE START; Enter line count of 15.	Carrier returns "15" is printed & the carrier is returned	Line count entered
TPWR button UP. Depress "SCAN"	Carrier returns, yellow light blinks, "13" prints, carrier returns, dummy cycle, followed by a tab and "SCAN 3" (DOUBLE indexed)	Scan of formatting instructions OK
27. TPWR button DOWN. PAGE START. Enter line count of 26	Carrier returns "26" is printed & the carrier is returned	Line count entered
TPWR button UP. Depress "SCAN"	Carrier returns, yellow light blinks, "25" prints, carrier returns, dummy cycle, "SCAN 4" prints (DOUBLE indexed)	Scan of formatting instructions OK
28. Insert blank card into hopper. Depress "SCAN"	Carrier returns, yellow light blinks, "07" prints, carrier returns. The text is recorded & the card is stacked.	Scan OK

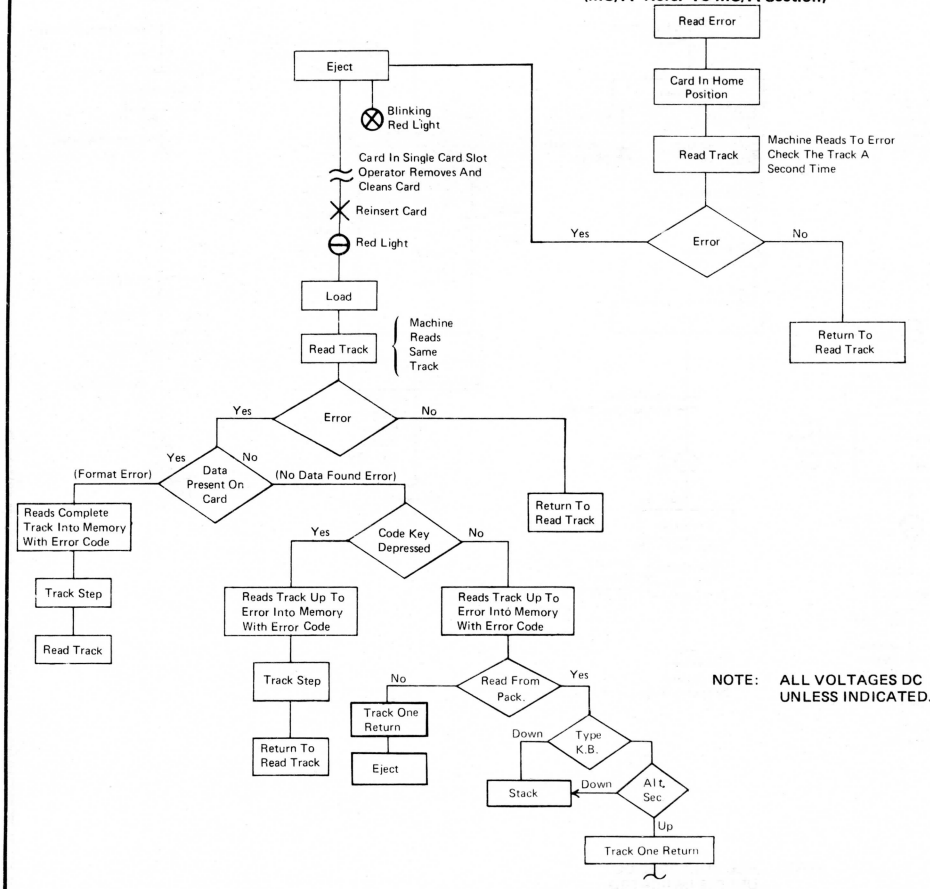
END OF "FUNCTIONAL TEST"


RECORD
Record K.B. Depressed
Card In Single Card Slot
No
Yes
Eject
No Action If:
1. Memory Empty
2. Alt. Sec. K.B. Down
Error In Page To Be Recorded
Yes
No
Red Light Blinks
Operator Corrects Error
Data In Memory Read From Pack
No
Yes
Feed
Card In Home Position
No
Yes
Solid Green Light
Record Track
PE Code Recorded
Yes
No
Stack
Track 50
No
Yes
Track Step
Stack
Or
Operator Inserts Card
Reloads Feed Slot
Record K.B. Depressed
Load
Feed
Card In Home Pos.
Yes
No
Record Track
PE Code Recorded
Yes
No
Stack
Track 50
Yes
No
Stack
Track Step
Solid Green Light
Operator Inserts Card
Load
READ FROM PACK
Read K.B. Depressed
Card In Home Position
Yes
No
Eject
No Action If:
1. Data In Mem. Read Through Single Slot
2. Alt. Sec. Up And Data In Alt. Section
Feed
A
Read Track
PE Code Read
No
Yes
Track 50
Yes
No
Track Step
A
TWPR K.B.
Down
Up
Stack
Down
ALT SEC
Up
Track 1 Return
TWPR K.B.
Down
Up
Stack
Down
ALT SEC
Up
Eject
Track 1 Return
Blinking Green Light
Operator Removes Card
Green Light



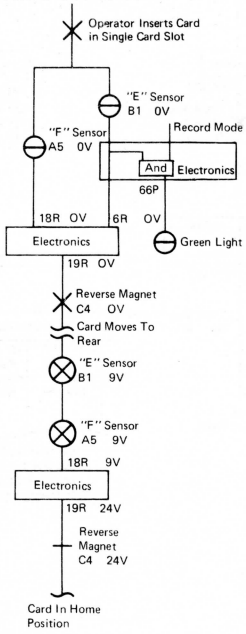
NOTE: ALL VOLTAGES DC UNLESS INDICATED.

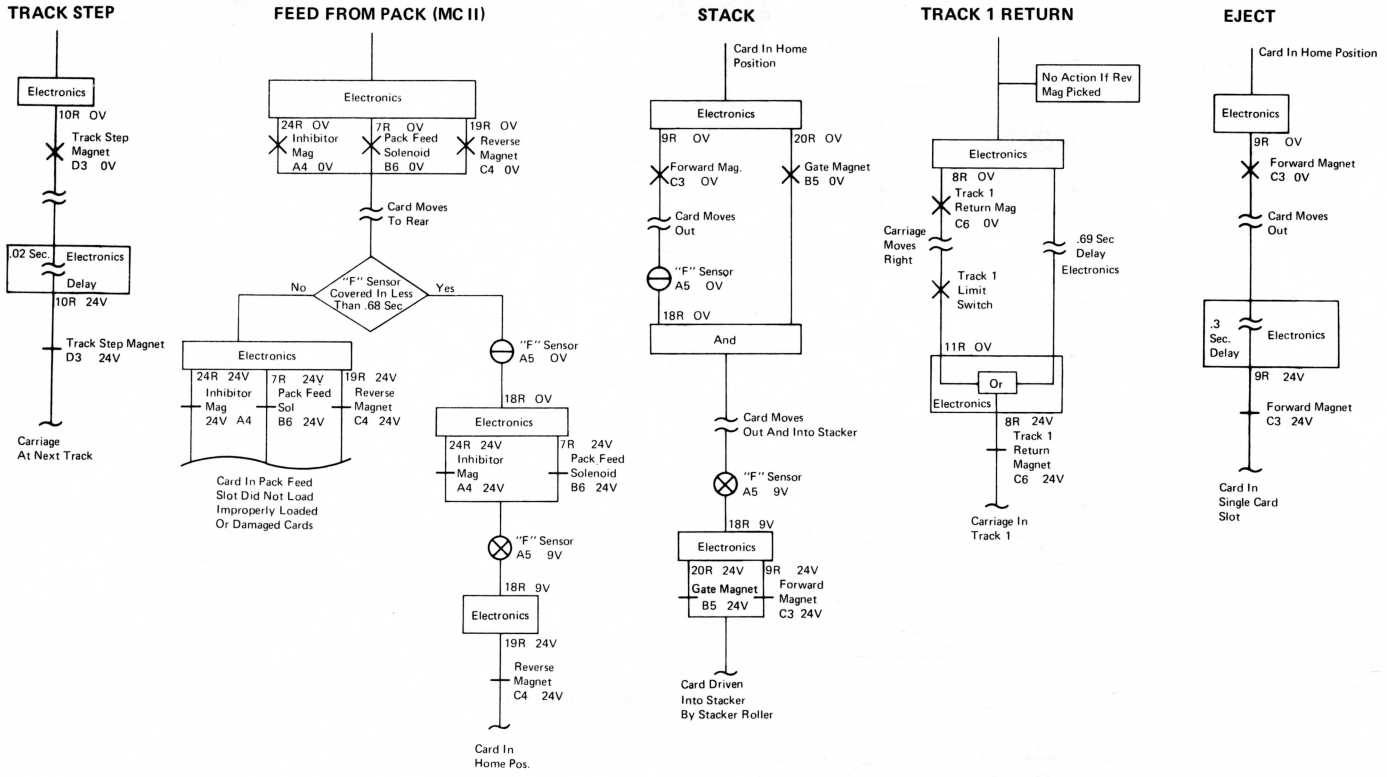
READ ERROR
(MC/A Refer To MC/A Section)



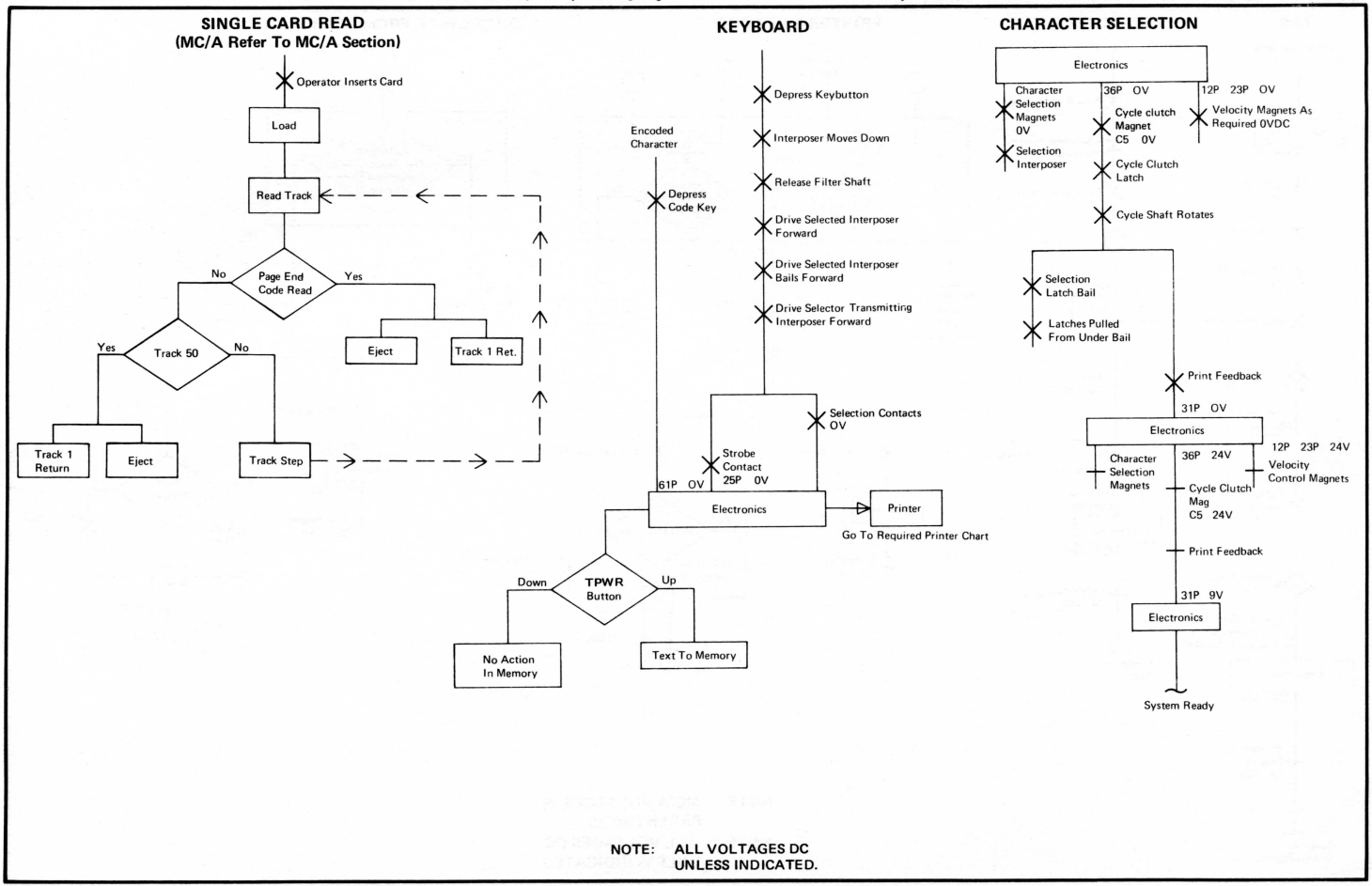
NOTE: ALL VOLTAGES DC UNLESS INDICATED.

LOAD
(MC/A Refer To MC/A Section)



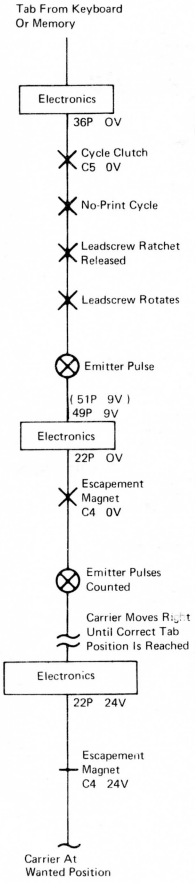


NOTE: ALL VOLTAGES DC UNLESS INDICATED.

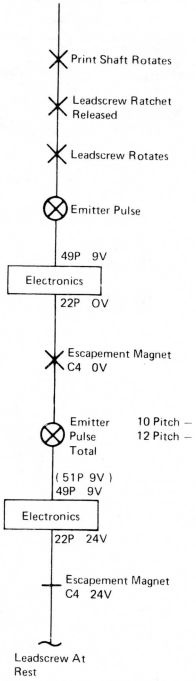


NOTE: ALL VOLTAGES DC UNLESS INDICATED.

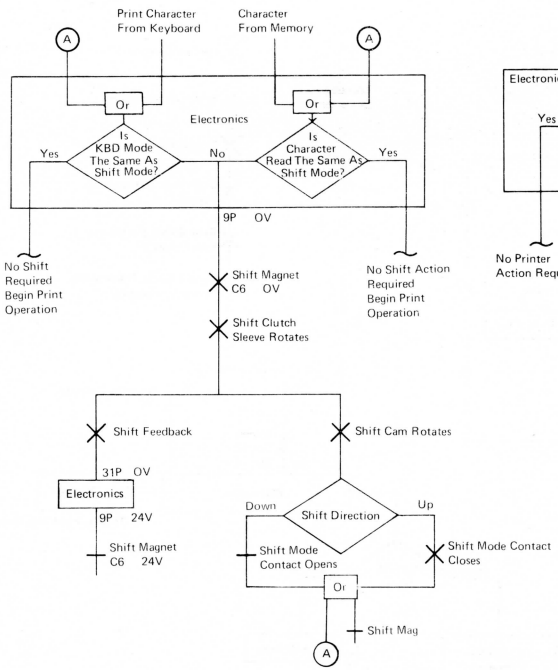
TAB



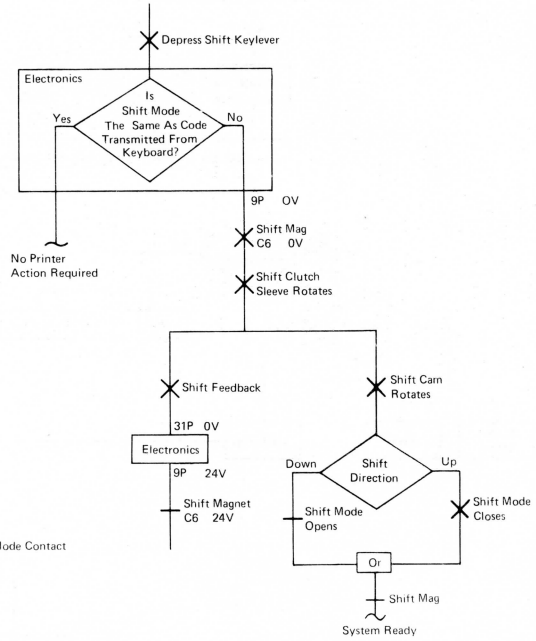
ESCAPEMENT



PRINTER SHIFT CYCLE



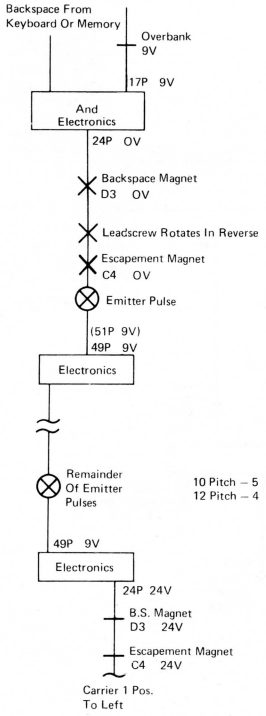
SHIFT CYCLE FROM KEYBOARD



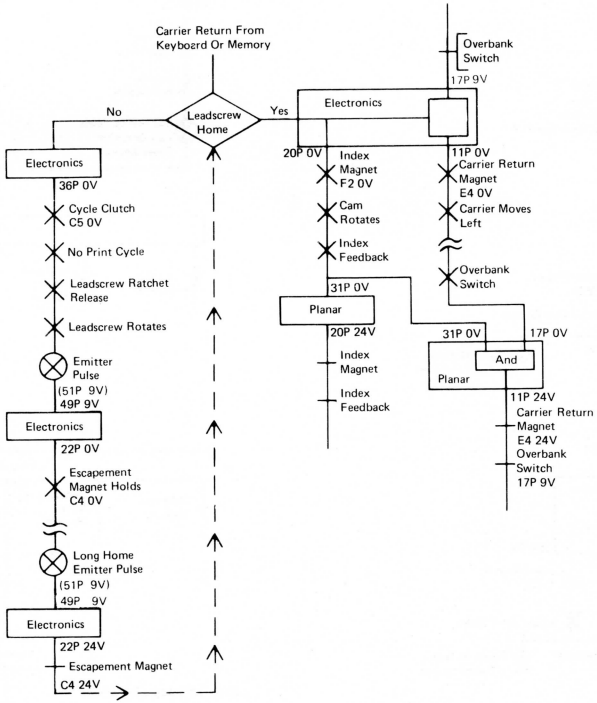
NOTE: MC/A VOLTAGES IN PARENTHESIS

NOTE: ALL VOLTAGES DC UNLESS INDICATED.

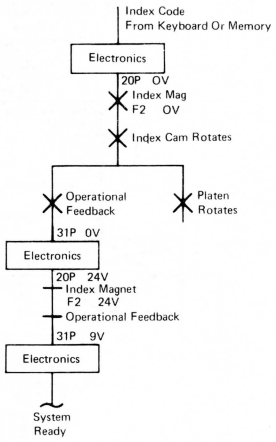
BACKSPACE



CARRIER RETURN



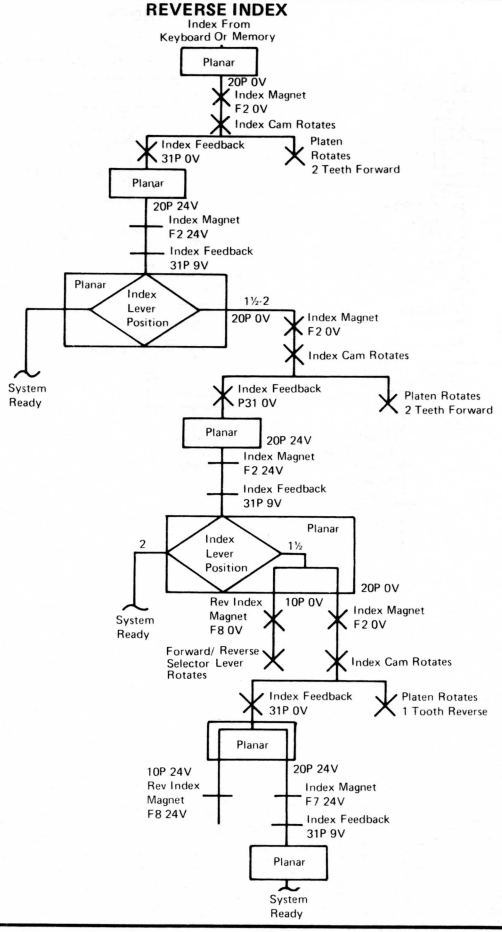
INDEX



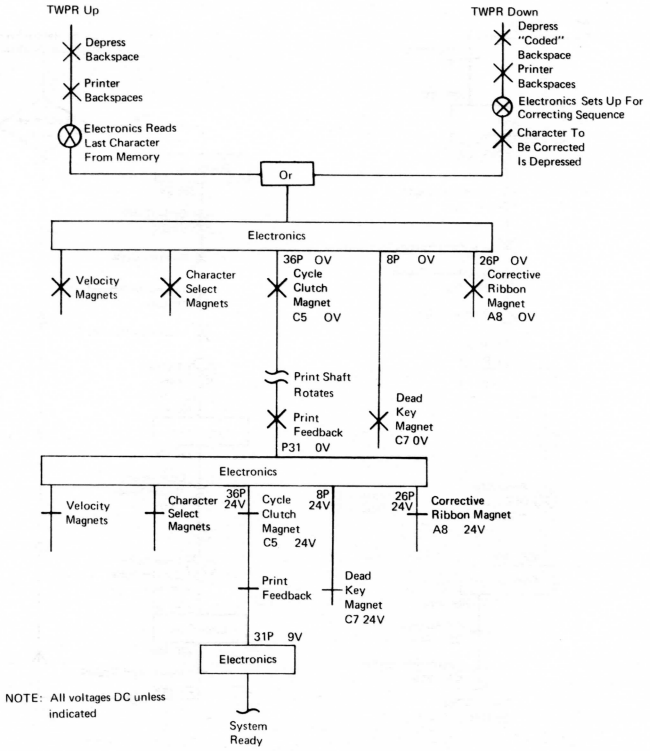
NOTE: MC/A VOLTAGES IN PARENTHESIS

NOTE: ALL VOLTAGES DC UNLESS INDICATED.

REVERSE INDEX

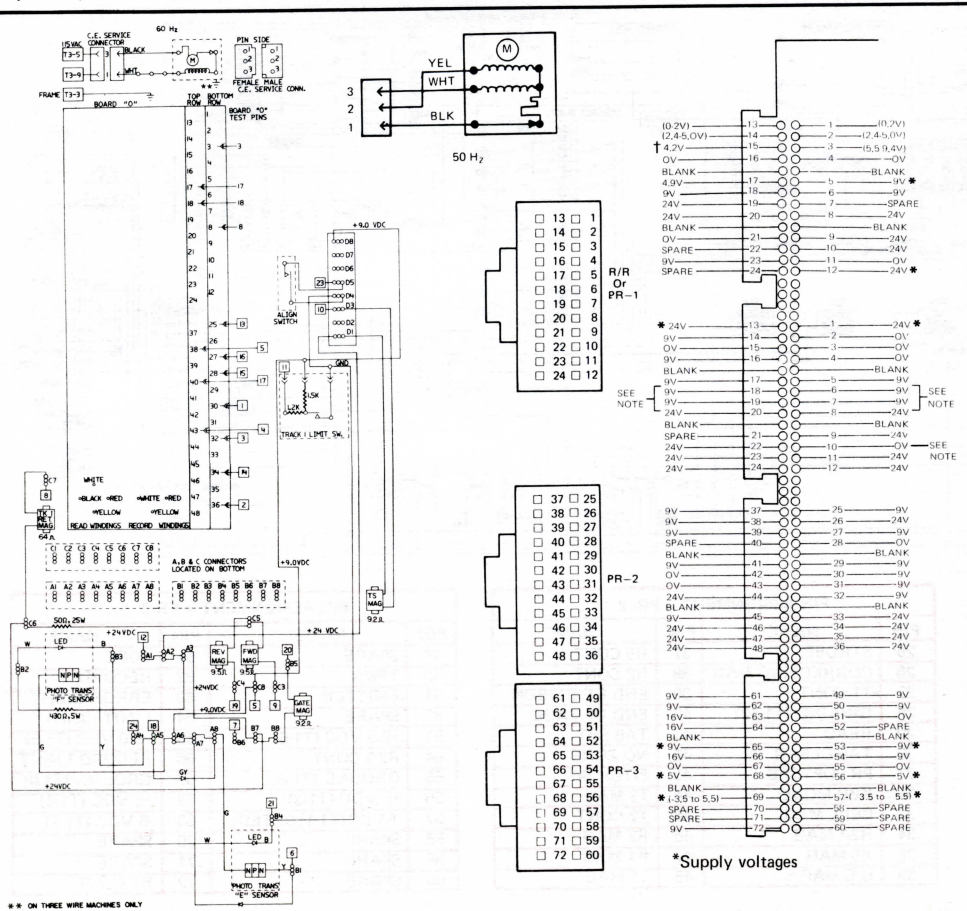


CORRECTING RIBBON CYCLE



NOTE: All voltages DC unless indicated

NOTE: ALL VOLTAGES DC UNLESS INDICATED.



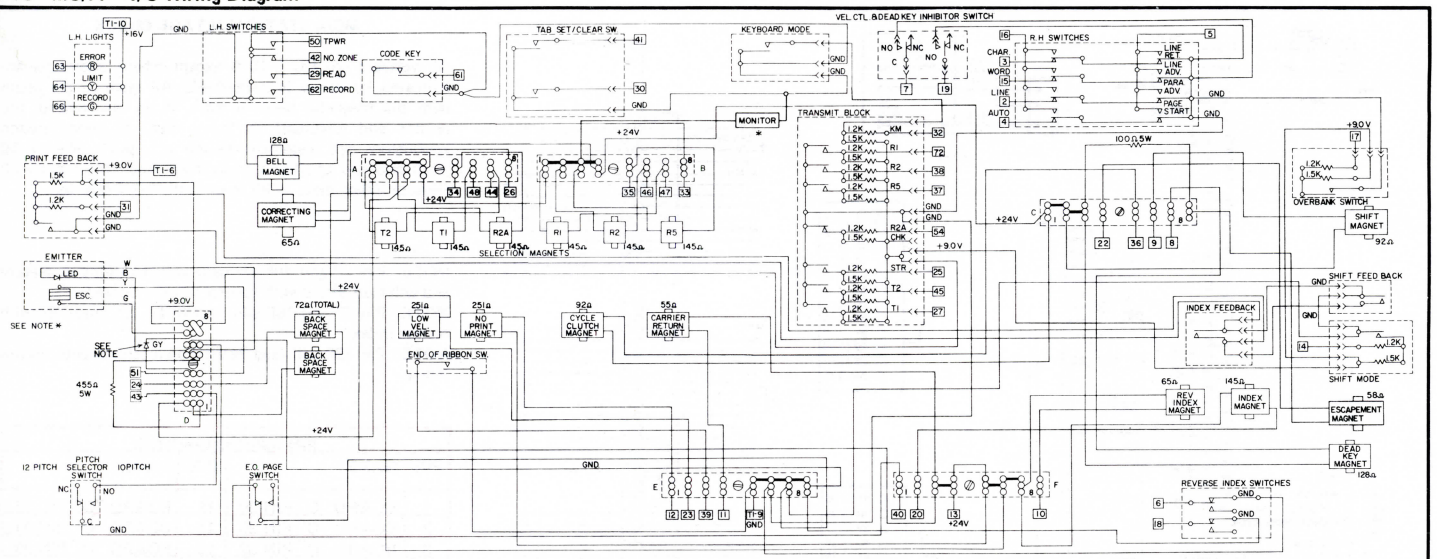
MC/A STATIC VOLTAGE CHECK

All voltages are DC ± 10 % except where tolerances are indicated by values in parenthesis. All readings are taken with the magnetic head in track 1, no card loaded, the printer and keyboard in lower case, all mode switch keybuttons up, alignment switch off, pitch selector 10 pitch and end of ribbon sensor held down. Machines with Reverse Index, place index lever in the 1-1/2 position.

NOTE: Pin 7P and 19P are used with multilingual feature and will read 9VDC with control wheel centered.
NOTE: Pin 6P and 18P will read 0VDC on machines with reverse index.
NOTE: Pin 10P will read 24VDC on machines with reverse index.

PIN ASSIGNMENT R/R			
PIN	NAME	PIN	NAME
1	BOARD "O" PIN 30	13	BOARD "O" PIN 25
2	BOARD "O" PIN 36	14	BOARD "O" PIN 34
3	BOARD "O" PIN 32	15	BOARD "O" PIN 28
4	BOARD "O" PIN 43	16	BOARD "O" PIN 27
5	BOARD "O" PIN 38 (+9.0VDC)	17	BOARD "O" PIN 40
6	"E" SENSOR	18	"F" SENSOR
7	BLANK	19	REV. MAG
8	TK. 1 RET. MAG	20	GATE MAG
9	FWD. MAG	21	GROUND
10	TS. MAG	22	SPARE
11	TK. 1 SWITCH	23	ALIGN SWITCH
12	+24VDC	24	BLANK

† Note: Cannot be measured accurately with tripplett meter, but voltage should not read either 0 or 8.5 VDC.



*MONITOR NOT USED IN WT

PIN ASSIGNMENT — PR-1			
PIN	NAME	PIN	NAME
1	+24 VDC (T1-11)	13	+24 VDC
2	LINE	14	SHIFT MODE
3	CHAR	15	WORD
4	AUTO	16	SEC MODE
5	ADV MODE	17	OVERBANK SW
6	DOUBLESPACE SW	18	SINGLE SPACE SW
7	MULTI CONT	19	LOW VEL CONT
8	DEAD KEY MAG	20	INDEX MAG
9	SHIFT MAG	21	SPARE
10	REV INDEX MAG	22	ESCAPEMENT MAG
11	C/R MAG	23	LOW VEL MAG
12	NO PRINT MAG	24	BACKSPACE MAG

PIN ASSIGNMENT — PR-2			
PIN	NAME	PIN	NAME
25	STROBE	37	R5 CONT
26	CORRECTING MAG	38	R2 CONT
27	-T1 CONT	39	END OF RIBBON
28	GROUND (T1-12)	40	END OF PAGE
29	READ	41	TAB SET
30	TAB CLEAR	42	NO ZONE
31	PR - OP - SFB	43	PITCH SW
32	KBD MODE	44	T2 MAG
33	BELL MAG	45	T2 CONT
34	R2A MAG	46	R2 MAG
35	R5 MAG	47	R1 MAG
36	C/C MAG	48	T1 MAG

PIN ASSIGNMENT — PR-3			
PIN	NAME	PIN	NAME
49	SPARE	61	CODE
50	TPWR	62	RECORD
51	EMITTER	63	ERROR LIGHT
52	SPARE	64	LIMIT LIGHT
53	+9.0 VDC (T1-6)	65	+9.0 VDC (T1-5)
54	R2A CONT	66	RECORD LIGHT
55	GROUND (T1-8)	67	GROUND (T1-9)
56	+5 VDC (T1-3)	68	+5 VDC (T1-4)
57	-5 VDC (T1-1) DETECT	69	-5 VDC (T1-7)
58	SPARE	70	SPARE
59	SPARE	71	SPARE
60	SPARE	72	R1 CONT

NOTE: Diode On D Connector May Be Located On Emitter Assembly.

IBM MAG CARD/A "QUICK CHECK"

(Perform each step in sequence — exactly as instructed)

NOTE: All checks performed in 10 pitch.

CHECK PROCEDURE	MACHINE RESPONSE	INDICATION	IF MALFUNCTION — GO TO
1. Turn power "Off" — then "On"	Card deck "clicks" — with power on	Power Supply — OK	Printer AC Wiring Diagram, Static Voltage Check
(ALL KEYBUTTONS "UP") 2. KEYBOARD LIGHT CHECK			
Read exercise card seven times	On seventh time card ejects & yellow light blinks	Yellow light — OK	Static Voltage Check, Wiring Diagram
Insert card upside down in card slot and depress record NO ZONE ↓ TPWR ↑	Red light blinks Green light comes on (Turn machine off, then on)	Green, Red Light — OK (E & F Sensor — OK)	
3. Operate all character and function keybuttons	Printer reacts exactly as keyboarded	Keyboard/Elec/Printer — OK	Applicable Keyboard Function Chart, Wiring Diagram, Static Voltage Check
4. Depress Page start, then AUTO	Machine prints out exact copy of Step 3 text	Electronic Memory — OK	Static Voltage Check, Wiring Diagram
5. Depress CODE and ¢/6	Carrier returns	Clear Memory from Keyboard — OK	Static Voltage Check, Wiring Diagram
Depress PAGE START and AUTO	No machine reaction		
6. Type several characters, then backspace to left margin	Text removed from paper	Correction Feature — OK	Correct Feature Function Chart Static Voltage Check, Wiring Diagram
Depress PAGE START, then AUTO NO ZONE ↓ TPWR ↓	No machine reaction		
7. Place exercise card in slot, then depress READ	Card ejected out slot Text read into memory	Read Operation — OK	Read Function Chart Voltage Check, Wiring Diagram Card Drive Adjustments
Insert a completely erased card in slot, then depress record	Text recorded on card (memory retained)	Record Operation — OK	Record Function Chart Voltage Check, Wiring Diagram Card Drive Adjustment
		Total Card Drive — OK	Card Drive Adjustment

IBM MAG CARD/A "QUICK CHECK"
MEMORY ACCESS/MODE BUTTONS/DELETE FUNCTIONS

(TURN MACHINE "OFF," THEN "ON" — READ EXERCISE CARD INTO MEMORY)

CHECK PROCEDURE	MACHINE RESPONSE	INDICATION	IF MALFUNCTION — GO TO
ALL BUTTONS UP — NO ZONE ↓ 8. Depress PAR ADV one time Depress LINE one time	Carrier returns *"Product — — in the"* plays out	PAR ADV — OK LINE Playout — OK	Voltage Check, Wiring Diagram, *On Machines With Format Feature, CHAR/STOP Should Be Depressed Twice To Receive Proper Response.
9. Depress LINE ADV one time Depress WORD one time	Carrier returns The word *"period"* plays out	LINE ADV — OK WORD Playout — OK	
10. Depress LINE RET one time * Depress CHAR/STOP one time	Carrier returns The letter *"p"* prints out	LINE RET — OK CHAR Playout — OK	
11. Depress CODE and LINE Depress LINE RET — then WORD	Printer spaces/backspace The word *"pover"* prints out	Delete Function — OK	

LINE LENGTH

(TURN POWER "OFF," THEN "ON" — START WITH ALL BUTTONS UP)

TPWR ↓ 12. Space EXACTLY 4 INCHES out from left margin, then depress CODE and PAR ADV	Carrier returns	Line Length Set —OK	Planar Package Voltage Check
13. Depress CODE and LINE RET Read a card and playout to check line length	No machine response		

(TURN MACHINE "OFF," THEN BACK "ON" BEFORE CONTINUING)

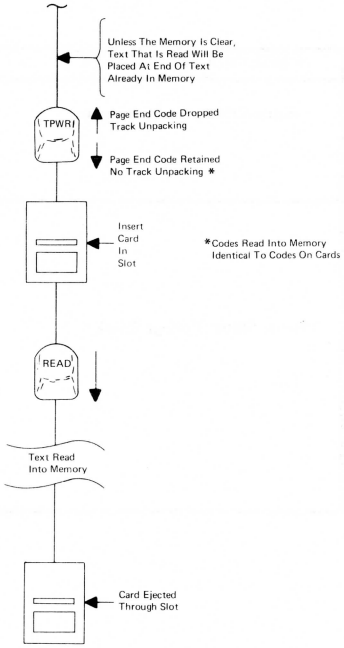
TAB/DEC TAB — CENTER/WORD UNDERSCORE

TPWR ↓ 14. Tab several times	Carrier stops every five spaces	Five Space Tab Grid — OK	Planar Package Voltage Check
15. Depress TAB CLR and CARR RETURN Depress TAB	Carrier returns Carrier moves to far right limit	TAB Clear — OK	Voltage Check, Wiring Diagram

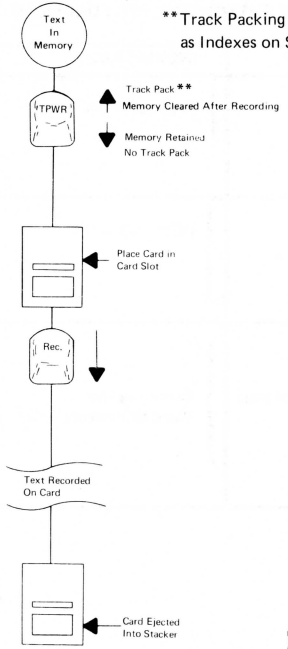
IBM MAG CARD/A "QUICK CHECK"
MEMORY ACCESS/MODE BUTTONS/DELETE FUNCTIONS

CHECK PROCEDURE	MACHINE RESPONSE	INDICATION	IF MALFUNCTION — GO TO
16. Depress TAB SET and CARR Return Tab several times TPWR ↑	Carrier returns Carrier stops every five spaces	TAB Set — OK	Voltage Check, Wiring Diagram
17. Depress code and ¼/½ three times, keyboard 1.00, then CARR RET Depress CODE and ¼/½ three times, keyboard 22.00, then CARR RET	Machine prints out as follows *1.00* *22.00*	DEC TAB — OK	Planar Static Voltage Check
18. Space to center of page Depress CODE and letter "C" Enter five N's — Req Spc five N's Depress CODE and "I"	Machine prints out at center of page *NNNNN NNNNN*	Centering and Word Underscore — OK	

TO READ A CARD

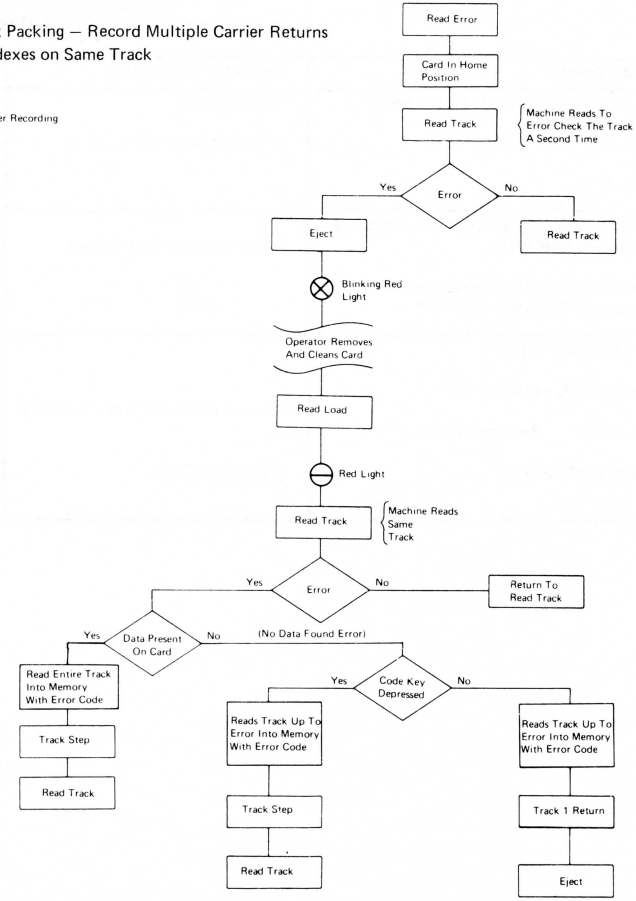


TO RECORD A CARD



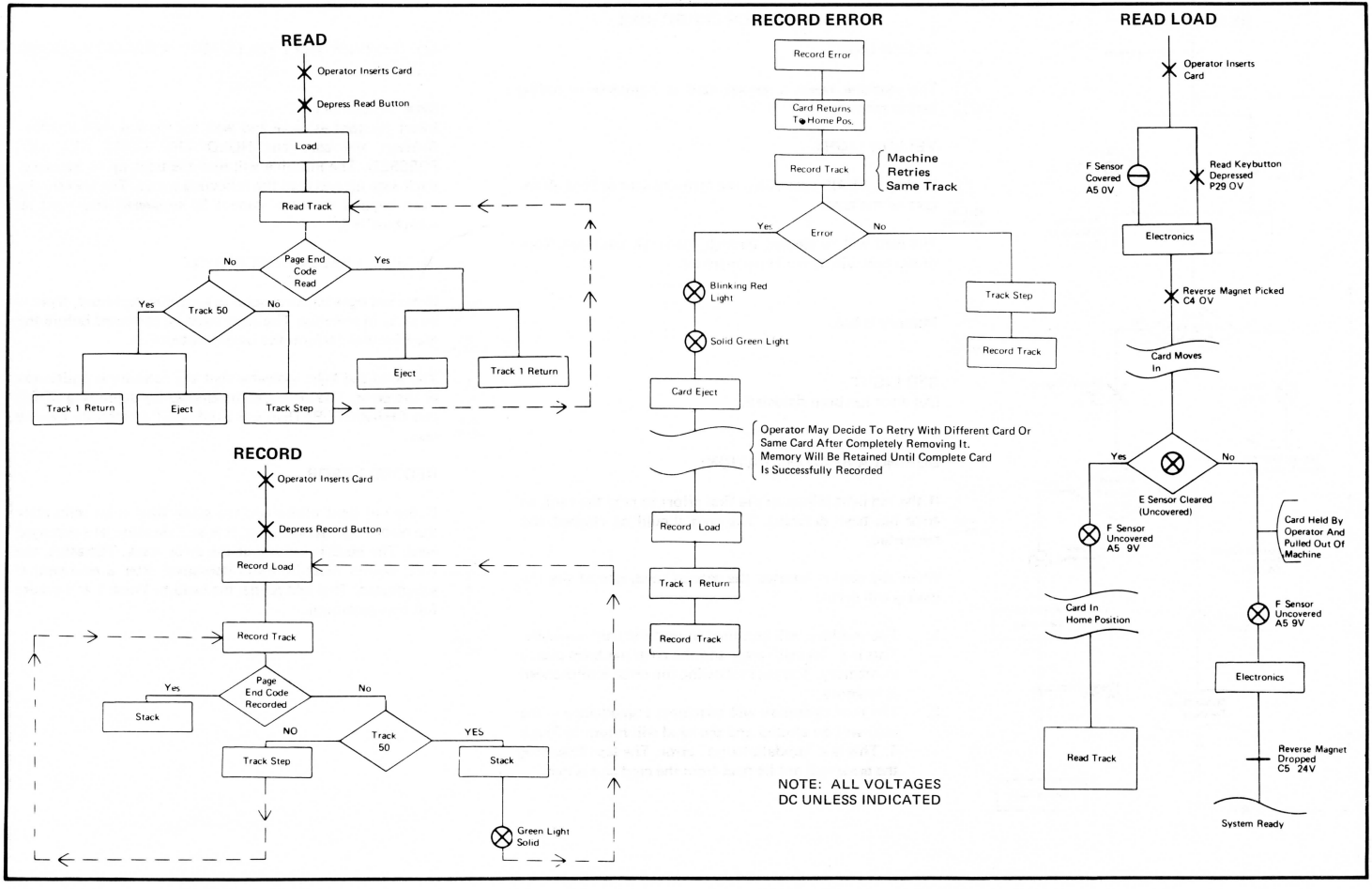
**Track Packing — Record Multiple Carrier Returns as Indexes on Same Track

READ ERROR

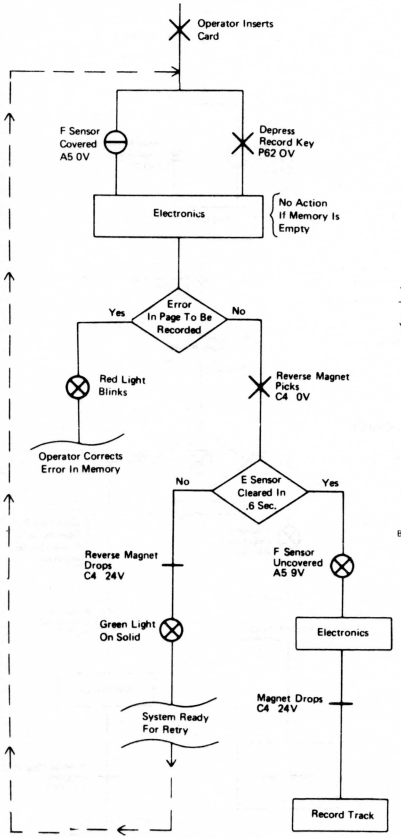


NOTES:

1. A page end code is always recorded at the end of a job. If the job requires more than one card, the page end code will be recorded at the end of the job on the second card.
2. When REC is depressed, only the text up to the next page end code in memory will be recorded. If a page end code is not found, the machine thinks the complete memory is a page and records a page end code at the end of text.


READ
Operator Inserts Card
Depress Read Button
Load
Read Track
Page End Code Read
No
Yes
Track 50
Yes
No
Track 1 Return
Eject
Track Step
Eject
Track 1 Return
RECORD
Operator Inserts Card
Depress Record Button
Record Load
Record Track
Page End Code Recorded
Yes
No
Stack
NO
Track 50
YES
Track Step
Stack
Green Light Solid
RECORD ERROR
Record Error
Card Returns To Home Pos.
Record Track
Machine Retries Same Track
Yes
Error
No
Blinking Red Light
Track Step
Solid Green Light
Record Track
Card Eject
Operator May Decide To Retry With Different Card Or Same Card After Completely Removing It. Memory Will Be Retained Until Complete Card Is Successfully Recorded
Record Load
Track 1 Return
Record Track
READ LOAD
Operator Inserts Card
F Sensor Covered A5 0V
Read Keybutton Depressed P29 0V
Electronics
Reverse Magnet Picked C4 0V
Card Moves In
Yes
No
E Sensor Cleared (Uncovered)
F Sensor Uncovered A5 9V
Card Held By Operator And Pulled Out Of Machine
Card In Home Position
F Sensor Uncovered A5 9V
Electronics
Read Track
Reverse Magnet Dropped C5 24V
System Ready
NOTE: ALL VOLTAGES DC UNLESS INDICATED

RECORD LOAD



LIGHT/ERROR CONDITIONS

GREEN LIGHT

GREEN SOLID

The machine needs a second card to complete recording text in memory.

YELLOW LIGHT

YELLOW BLINKING

During a READ operation, the memory cannot hold all the text on the card.

The card will be ejected through the single card slot. None of the text will be read into memory.

YELLOW SOLID

Memory is full.

RED LIGHT

(An error has been detected.)

DURING A READ OPERATION:

RED BLINKING

If the red light blinks on the first effort to read the card, an error has been detected. The card should be cleaned and reinserted.

When the card is inserted the second time, one of the following will occur:

1. The machine will continue to read the card normally. This is a "format" error and the error has been placed in memory. The text following the error is unchanged in memory.
2. The read operation will terminate immediately — the card will be ejected and the head will return to Track 1. This is a "no-data-found" error. The text following the error will not be read from the card and is lost.

TO RECOVER TEXT FOLLOWING A NO-DATA-FOUND ERROR:

Clear the memory.
Insert the card as usual and wait for the red light to blink. Reinsert the card but HOLD THE CODE KEY DEPRESSED. The machine will read the track up to the error, track step up and read the following tracks. The text on the track beyond the error cannot be recovered and must be rekeyboarded.

DURING A RECORD OPERATION:

RED BLINKING

If the red light blinks as soon as record is depressed, there is an error in memory. The error must be corrected before the machine will perform the record instruction.

RED SOLID

The solid red light indicates that the memory is positioned at the error. The error can be cleared by depressing CODE and CHAR/STOP. Then use LINE/RET to identify missing text.

RECORD ERROR

RED BLINKING & GREEN SOLID

If the red light blinks and the green light is on solid after the record operation begins, it is an indication of a damaged card. The head is waiting at the error track. Therefore, the REC button must be again depressed after a new card is substituted. This will return the head to Track 1 and ensure full text recording.

(PERFORM EACH STEP IN SEQUENCE – EXACTLY AS INSTRUCTED.)
SET MACHINE: CARRIER AT LEFT MARGIN, 12P, ALL KEYBUTTONS UP.

PROCEDURE	MACHINE REACTION	INDICATION	IF MALFUNCTION – GO TO
1. Turn Power "Off" – Then "On"	AC Motor Starts, Power Supply Fan "On"	AC To Printer And Power Supply – OK	Printer AC Wiring Diagram
2. Operate The Character Keybutton Rows, One At A Time, Ending Each With A C/Ret. Tab, Then Repeat Above In Upper Case	Printer Reacts Exactly As Keyboarded	Keyboard/Elec./ Printer – OK	Track 51 Info., Applicable Keyboard Function Chart, Wiring Diagram, Static Voltage Check
3. Depress "Page Start"	Printer C/Returns	"Page Start" – OK	Planar Static Volt. Check, Wiring Diagram
4. Depress "Auto"	Printer Plays Back Keyed Information On 2 Lines With Second Line Indented	Elec. Memory – OK C/Ret. Conv. – OK "Auto" – OK	Planar Static Volt. Check Wiring Diagram
5. Backspace Several Times	Text Removed From Paper	Corr. Feat. – OK	Corr. Feat. Func. Chart
6. Depress "Code" And Backspace Several Times	Carrier Backs Up, Correction Feature Does Not Operate	Required Back-space – OK	Planar Static Volt. Check, Wiring Diagram
7. "Page Start," Switch To 10P, – Depress "Word"	Printer Plays Back 1st Character Keybutton Row Expanded	Word – OK Switch Pitch – OK	
8. Depress "Line"	Printer Plays Back Rest Of 1st Line Of Information	Line – OK	
9. Depress "Line Ret."	Printer C/Rets	Line Ret. – OK	
10. Depress "Par. Adv."	Printer Space/b.s.	Par. Adv. – OK	
11. Depress "Char."	Printer Tabs	Char. – OK	
12. Depress "Code" + "Line" Depress "Line Ret." – Then "Auto"	Printer Space/b.s. Printer Tabs And Stops	Delete Function – OK	
13. Depress "Page Start" Then "Line Adv."	Printer C/Rets, Then Space/b.s.	Line Adv. – OK	

(PERFORM EACH STEP IN SEQUENCE — EXACTLY AS INSTRUCTED.)

PROCEDURE	MACHINE REACTION	INDICATION	IF MALFUNCTION — GO TO
14. Depress "Code" + "3" Keybutton Depress "Store" Button	No Printer Reaction Yellow Light Blinks Approx. 7 Sec.	Store — OK	Tape Loop Store Diag. Chart
15. Depress "Page Start" Depress "Auto"	No Printer Reaction Printer Tabs	(End Of Store) Rec. End — OK	Planar Static Voltage Check Wiring Diagram
16. Depress "Code" + "6" Keybutton Depress "Page Start" + "Auto"	Printer C/Rets No Machine Reaction	Cir — OK	
17. Depress "Recall"	Yellow Light Blinks Approx. 3.5 Sec.	Recall — OK Power Supply — OK	Tape Loop Recall Diag. Chart Power Supply Check
18. Keyboard 5 Hyphens, 5 Zs Then Depress "Code" And Keyboard 5 Hyphens Depress "Auto"	Printer Reacts As Keyboarded Printer Plays Back To Line End Zone And Stops	Line End Zone — OK	
19. Depress "Hyphen," Then "Auto" Depress "Page Start" And "Auto"	Printer C/Rets And Ends Play Back Printer Plays Back On One Line Dropping The First 5 Hyphens And The Last Single Hyphen	Required Hyphen — OK	
20. Depress "Code" + "6" Keybutton Depress "Code" And "1/2" Keybutton Three Times, Keyboard 1.00, Then Car./Ret. Depress "Code" And "1/2" Keybutton Three Times, Keyboard 22.00 Then Car./Ret.	"Carrier Return" Machine Prints Out As Follows: 1.00 22.00	Dec. Tab — OK	Planar Static Volt. Check, Wiring Diagram
21. Space To Center Of Page. Depress "Code" And "C" Keyboard 5 "N"s — "Required" Space" — 5 "N"s Depress "Code" And "I" Keybutton	Machine Prints Out At Center Of Page NNNNN NNNNN	Centering And Word Underscore — OK	

(PERFORM EACHSTEP IN SEQUENCE – EXACTLY AS INSTRUCTED.)

PROCEDURE	MACHINE REACTION	INDICATION	IF MALFUNCTION – GO TO
22. Depress "Store" Then While The Tape Loop Is Operating Depress And Release The Selector Dial	Both Lights Blink At End Of Tape Loop Operation	Lights – OK	Planar Static Volt. Check
TURN MACHINE "OFF," THEN BACK "ON" BEFORE CONTINUING			
23. Latch Down "TPWR" Button Tab Several Times	Carrier Stops Every 5 Spaces	5 Space Tab Grid – OK	Planar Static Volt. Check
24. Depress "Tab CLR" And Car./Ret. Depress "Tab"	Carrier Returns Carrier Returns To Right Limit	Tab Clear – OK	Planar Static Volt. Check, Wiring Diagram
25. Depress "Tab Set" And Car./Ret. Tab Several Times	Carrier Returns Carrier Stops Every 5 Soaces	Tab Set – OK	Planar Static Volt. Check, Wiring Diagram
26. Tab Exactly 4" Out From Left Margin (8 Tabs) Then Depress "Code" And "Par. Adv."	Carrier Returns	Line Length Set – OK	Planar Static Volt. Check
27. Depress "Page Start" And "Auto"	No Machine Reaction	TPWR Button – OK	Planar Static Volt. Check, Wiring Diagram

PLAYOUT OF FUNCTIONAL CHECK
NO ZONE LATCHED DOWN

	PARA ADV	LINE ADV/ DEL.
Before continuing, turn the Track Selector Dial away from track 51!--- Did you put the setscrew back into place?	1	1
The information to follow is a printer exercise. Set the Pitch Selector Lever on 12p and the Margin Lever on 18 on the 12p scale.	2	4
The green grass grew on the side of a hill. The bells can be heard any time of day. Zebra run freely on the jungle plain. Quickly men, victory is ours if we give a little extra. Will we ever conquer the world? Some say yes, others say no. Listen to the rhythm!	3	8
SPACE/BACKSPACE TEST CcCcCcC

OVERBANK TEST 18 34

O
V
E
R
B
A
N
K

This is the end of the functional check. If more extensive 27 44
testing of a particular function is required, delete the
other information from memory and install a repeat(rept) code
after that section.

Information for testing of the special applications Paragraph 28 49
Indent and Reverse Index follow this paragraph. Depress
"Auto" to continue.

PARAGRAPH INDENT TEST 29 53

A "required tab " instruction is given by depressing the "code" button
and tapping the "tab" keybutton. A "required tab" sets up an automatic
indent eliminating the need to tab for each indented line. As many
as fourteen indent or tab levels may be stored in memory. To
increase the indent level you have only to add an additional
"required tab" instruction.
When you want to cancel the
indenting, you should end
the line with a "required
carrier return."

If you want to reduce the indent level you must end the line with a
"required carrier return" and then give the "required tab" in-
struction again.

REVERSE INDEX TEST 35 68

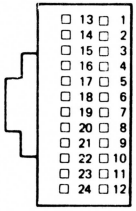
Depressing the "code" button and tapping the "Y" or "H" keybutton will
cause the index to operate independently of the index selector lever.

These are special codes that are inserted in memory which are used for "sub"
and
"super"
scripts.

Note:

Carrier Returns Removed To Allow Example Of Playout To Fit On This Page

All voltages are DC ± 10%. All planar static readings are taken with the printer and keyboard in lower case, all mode keybuttons up, pitch selector 12 pitch and end of ribbon sensor held down. Machines with Reverse Index place index lever in the 1-1/2 position. CAUTION: TURN POWER OFF BEFORE DISCONNECTING A PLANAR CONNECTOR.



Planar Board Connector (Wiring Side)

POSITION NO. 1 PLANAR BOARD CONNECTOR (TAPE LOOP)				
PIN	STATIC	ACTIVE	NAME	TERMINATES
1	4-6	+5	Zero Detect (Store)	Bd. Zero 10
2	0 to .8	**	HLD	Bd. Zero 13
3	0 to .8	**	Write 1	Bd. Zero 12
4	0 to .8	*	Motor Emitter	Term Blk. Pin 5
5	+24	*	Motor	Motor Board
6	+5	+4	Photo Cell	Term Blk. Pin 1
7	+24	+24	+24 VDC	Term Blk. Pin 4
8	+8.5	+8.5	Power on Reset	Bd. Zero 6
9	0 Ohms	0 Ohms	GND	Motor Board
10	0 Ohms	0 Ohms	GND (Keylock)	At Switch
11	+12	+12	+12 VDC	Bd. Zero 2
12	+24	+24	+24 VDC	Motor Board
13	0 to .8	**	HLU	Bd. Zero 9
14	0 to .8	*	Write 0	Bd. Zero 8
15	0 to .8	**	Erase P	Bd. Zero 7
16	+8.5	0	Tape Emitter	Term Blk. Pin 6
17	+8.5	0	Dial Switch (Keylock)	At Switch
18	+8.5	+8.5	+8.5 VDC	Term Blk. Pin 2
19	0 to .8	**	Motor Slow	Planar Sig.
20	0 Ohms	0 Ohms	GND	Term Blk. Pin 3
21	0 Ohms	0 Ohms	GND	Bd. Zero 5
22	– 12	– 12	– 12VDC	Bd. Zero 1
23	+8.5	+8.5	+8.5 VDC	Bd. Zero 4
24	– 5	– 5	– 5VDC	Bd. Zero 3

POSITION NO. 2 PLANAR BOARD CONNECTOR				
PIN	STATIC	ACTIVE	NAME	TERMINATES
1	+24	0	Esc. Magnet	C-4
2	+24	+24	24 V (To Printer)	E-1
3	+12	†	+12 VDC	PS-5
4	+24	0	Cycle Clutch	C-5
5	+12	0	Yellow Light	At Light
6	+12	0	Red Light	At Light
7	+24	0	Backspace Mag	D-3
8	+24	0	Correction Ribbon	A-8
9			Spare	
10			Spare	
11			Spare	
12	+8.5	0	Overbank Sw.	At Switch
13	+5	†	+5 VDC	PS-1
14	+24	†	+24 VDC	PS-2
15	– 12	†	– 12 VDC	PS-3
16	–5	†	– 5 VDC	PS-4
17	0	+8.5	Emitter	D-4
18	+24	0	Bell Magnet	B-8
19	+24	0	Car Ret. Magnet	F-2
20	+24	0	T2 Magnet	A-7
21			Spare	
22			Spare	
23			Spare	
24	+8.5	0	Feedback (Prt. Ind. Sh.)	At Switch

* VOLTAGES CHANGE DURING STORE OR RECALL AND CANNOT BE MONITORED WITH TRIPLETT METER

** SEE ACTIVE READINGS TAPE LOOP DIAGNOSTICS

† POWER SUPPLY INPUTS

†† VOLTAGES DIFFER WITHOUT FEATURE

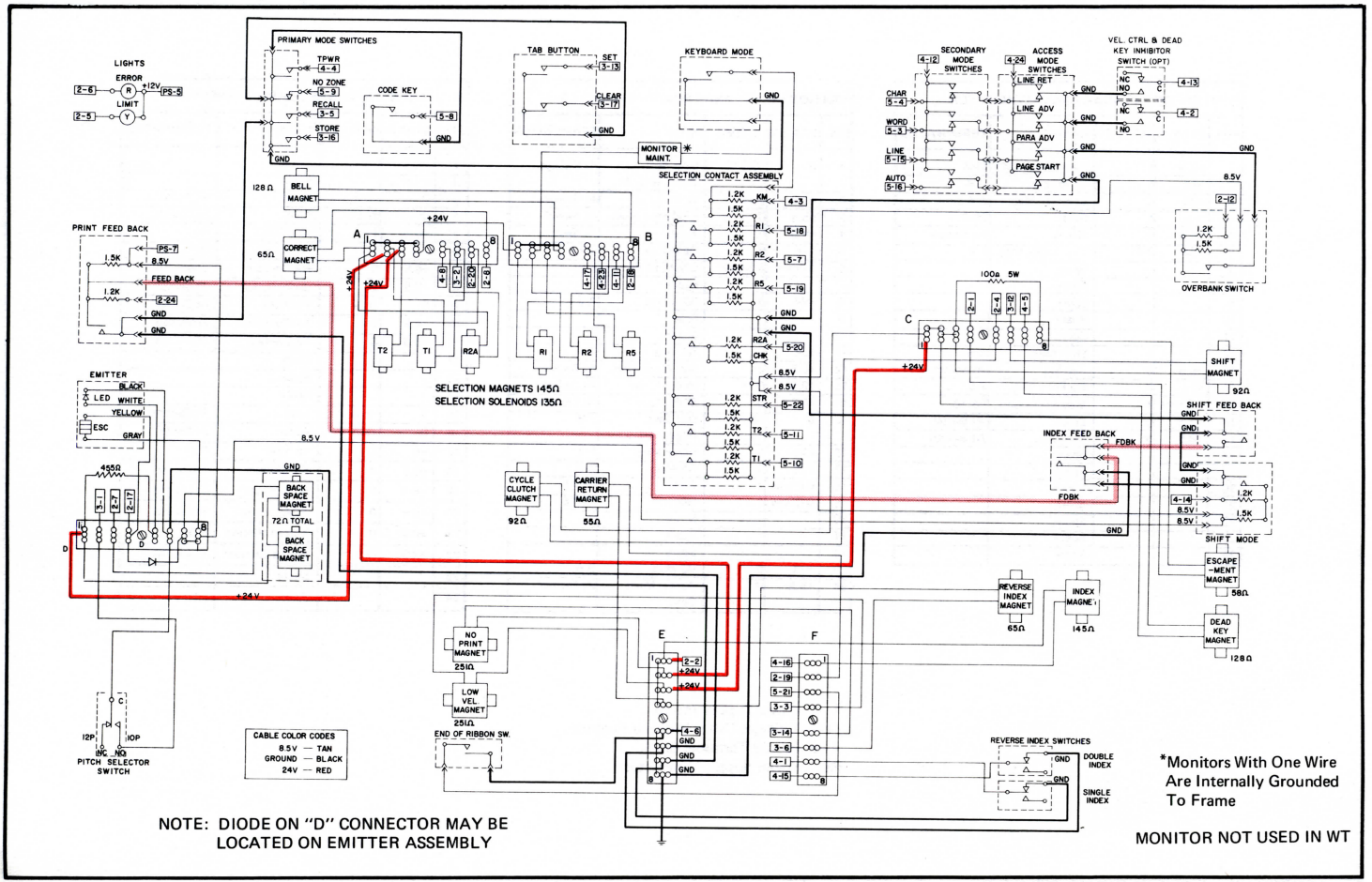
A–F Printer Terminal Block
PS Power Supply Connector

POSITION NO. 3 PLANAR BOARD.CONNECTOR				
PIN	STATIC	ACTIVE	NAME	TERMINATES
1	+8.5	0	Pitch Swt. (12P)	D-2
2	+24	0	T1 Magnet	A-6
3	+24	0	Low Vel. Mag.	F-4
4	−5	†	Sense	PS-9
5	+8.5	0	Recall	At Switch
6	+24	0 ††	Rev. Index Mag.	F-6
7			Spare	
8			Spare	
9			Spare	
10			Spare	
11			Spare	
12	+24	0	Shift Mag.	C-6
13	+8.5	0	Tab Set	At Switch
14	+24	0	No Print Mag.	F-5
15	0 Ohms	†	Magnet Ground	PS-10
16	+8.5	0	Store	At Switch
17	+8.5	0	Tab Clear	At Switch
18			Spare	
19			Spare	
20			Spare	
21			Spare	
22			Spare	
23			Spare	
24			Spare	

POSITION NO. 4 PLANAR BOARD CONNECTOR				
PIN	STATIC	ACTIVE	NAME	TERMINATES
1	0	+8.5 ††	Sing. Swt. (Rev. Ind. 1)	At Switch
2	+8.5	0 ††	Multi. Ling.	At Switch
3	+8.5	0	Keyboard Mode	At Switch
4	+8.5	0	Tpwr.	At Switch
5	+24	0	Dead Key	C-7
6	0 Ohms	0 Ohms	GND (To Printer)	E-5
7			Spare	
8	+24	0	R2A Mag.	A-5
9			Spare	
10			Spare	
11	+24	0	R1 Mag.	B-7
12	+8.5	0	Sec. Mode Com.	At Switch
13	+8.5	0 ††	Multi. Ling.	At Switch
14	+8.5	0	Shift Mode	At Switch
15	0	+8.5 ††	Dbl. Swt. (Rev. Ind. 2)	F-8
16	+24	0	Index Mag.	F-1
17	+24	0	R5 Mag.	B-5
18	0 Ohms	†	GND	PS-11
19	0 Ohms	†	GND	PS-12
20			Spare	
21			Spare	
22			Spare	
23	+24	0	R2 Mag.	B-6
24	+8.5	0	Access Mode Com.	At Switch

POSITION NO. 5 PLANAR BOARD CONNECTOR				
PIN	STATIC	ACTIVE	NAME	TERMINATES
1			Spare	
2			Spare	
3	0	+8.5	Word	At Switch
4	0	+8.5	Char.	At Switch
5	+8.5	†	+8.5 VDC	PS-7
6	−5	†	−5 VDC	PS-6
7	+8.5	0	R2 Contact	Trans. Blk.
8	+8.5	0	Code Switch	At Switch
9	0	+8.5	No Zone	At Switch
10	+8.5	0	T1 Contact	Trans. Blk.
11	+8.5	0	T2 Contact	Trans. Blk.
12			Spare	
13			Spare	
14			Spare	
15	0	+8.5	Line	At Switch
16	0	+8.5	Auto	At Switch
17	+5	†	+5 VDC	PS-1
18	+8.5	0	R1 Contact	Trans. Blk.
19	+8.5	0	R5 Contact	Trans. Blk.
20	+8.5	0	R2A Contact	Trans. Blk.
21	+8.5	0	End of Ribbon	F-3
22	+8.5	0	Strobe Contact	Trans. Blk.
23			Spare	
24			Spare	

† Power Supply Inputs
†† Voltages Differ Without Feature
A–F Printer Terminal Block
PS Power Supply Connector


LIGHTS
ERROR
LIMIT
PRIMARY MODE SWITCHES
TPWR
NO ZONE
RECALL
STORE
CODE KEY
TAB BUTTON
SET
CLEAR
KEYBOARD MODE
MONITOR MAINT.
SECONDARY MODE SWITCHES
ACCESS MODE SWITCHES
LINE RET
LINE ADV
PARA ADV
PAGE START
CHAR
WORD
LINE
AUTO
VEL. CTRL & DEAD KEY INHIBITOR SWITCH (OPT)
SELECTION CONTACT ASSEMBLY
BELL MAGNET
CORRECT MAGNET
PRINT FEED BACK
FEED BACK
OVERBANK SWITCH
SELECTION MAGNETS 145Ω
SELECTION SOLENOIDS 135Ω
EMITTER
BLACK
WHITE
YELLOW
GRAY
LED
ESC
BACK SPACE MAGNET
72Ω TOTAL
CYCLE CLUTCH MAGNET
CARRIER RETURN MAGNET
SHIFT MAGNET
SHIFT FEED BACK
INDEX FEED BACK
FDBK
SHIFT MODE
ESCAPE-MENT MAGNET
DEAD KEY MAGNET
REVERSE INDEX MAGNET
INDEX MAGNET
NO PRINT MAGNET
LOW VEL MAGNET
END OF RIBBON SW.
REVERSE INDEX SWITCHES
DOUBLE INDEX
SINGLE INDEX
PITCH SELECTOR SWITCH
CABLE COLOR CODES
8.5V — TAN
GROUND — BLACK
24V — RED
NOTE: DIODE ON "D" CONNECTOR MAY BE LOCATED ON EMITTER ASSEMBLY
*Monitors With One Wire Are Internally Grounded To Frame
MONITOR NOT USED IN WT

SYSTEM BUSY CHECK

(Keyboard Cycles With No Printer Response)

1. With the "TPWR" button unlatched, turn the printer off and back on. Check to see if the system is still busy.
   ..... NO — Go to step 3A.
   YES:
   A. Is the power supply fan running?
   ..... YES — Go to step 2.
   NO - Check the AC wiring to the power supply.
   B. Check the printer DC connector at power supply for good contact ..... YES — Go to step 2.
2. Does yellow light blink? ..... NO — Go to step 3.
   YES:
   A. Check the tape loop home sensor switch.
   B. Check the planar connectors for good contact.
   If the system is still busy .... YES — Go to step 4.
3. Operate the keyboard to see if the system is still busy
   ..... YES — Go to step 4.
   NO:
   A. Operate the keyboard until it becomes busy again.
   B. Use the proper function chart to diagnose the malfunction.
4. Perform a static check of the power supply inputs to the planar:

1. 2-3 +12V	7. 3-15 GND
2. 2-13 +5V	8. 4-18 GND
3. 2-14 +24V	9. 4-19 GND
4. 2-15 -12V	10. 5-5 +8.5V
5. 2-16 -5V	11. 5-6 -5V
6. 3-4 -5V	12. 5-17 +5V

   ..... Power supply OK — Go to step 5.
   NO:
   A. Check planar connectors for good contact.
   B. Use power supply diagnostics to check the power supply and fuses.
      1. If power supply checks OK, check the cable from the power supply to the planar.
      2. If the cable checks OK, replace the planar.
5. Hand cycle a character and check planar 5-22 (strobe) for a static level of 8.5V to an active level of 0V
   ..... YES — Go to step 6.
   NO — Check the keyboard transmit board adjustments and wiring.
6. Check planar 2-24 (feedback) for a static level of 8.5V
   ..... YES — Go to step 7.
   NO — Check the printer feedback circuit (wiring diagram).
7. Perform a complete planar voltage check **Voltage Check — OK**
   ..... YES — Go to step 8.
   NO:
   A. Check the related printer function for the voltage variation.
   B. Replace the planar.
8. Check the printer "ground loop" (wiring diagram).

   (To check ground loop, set meter on .6VDC scale, check for 0 to .3V between frame of printer and E-5, 6, 7 and E-8. If greater voltage is present, replace, recrimp or solder jumper wires to taper pins.)
   Ground loop OK ..... Replace planar.

TAPE LOOP DIAGNOSTICS
Read/Record Head And Board 0 Test Procedure

RESISTANCE

1. With power off, unplug the read/record head connector. If the resistance readings are incorrect, the head should be replaced.

   A. R X 1K scale — No continuity between the yellow lead and the black lead.
   B. R X 1 scale — 71-79 ohms between the red and yellow leads. (110—122 ohms for 100 track)
   C. R X 1 scale — 18-22 ohms between the black and white leads.

STATIC READINGS

2. With the cable connector unplugged from Board 0, check the following input voltages with power on. If any of the following voltage levels are incorrect, check the cable planar and power supply.

   A. (-11)—(-13) VDC between pin 1 and ground.
   B. (+11)—(+13) VDC between pin 2 and ground.
   C. (-4.2)—(-5.5) VDC between pin 3 and ground.
   D. (+7.6)—(+10) VDC between pin 4 and ground.
   E. (+6)—(+10) VDC between pin 6 and ground.
   F. (0)—(+0.8) VDC between pin 8 and ground.
   G. (0)—(+0.8) VDC between pin 12 and ground.

OUTPUTS

3. With the cable connector and head connector plugged into Board 0, check the following voltages. If any of the voltage levels read incorrectly, Board 0 is defective and should be replaced.

   Head Connector
   A. (-0.1)—(+0.1) VDC between the red and yellow lead.
   B. (+10)—(+12) VDC between the black lead and ground.
   C. (+10)—(+12) VDC between the white lead and ground.

   Cable Connector
   D. (0)—(+0.8) VDC between pin 9 and ground.
   E. (-1)—(+1) VDC between pin 11 and ground.
   F. (0)—(+0.8) VDC between pin 13 and ground.
   G. (-1)—(+.1) VDC between pin 14 and ground.

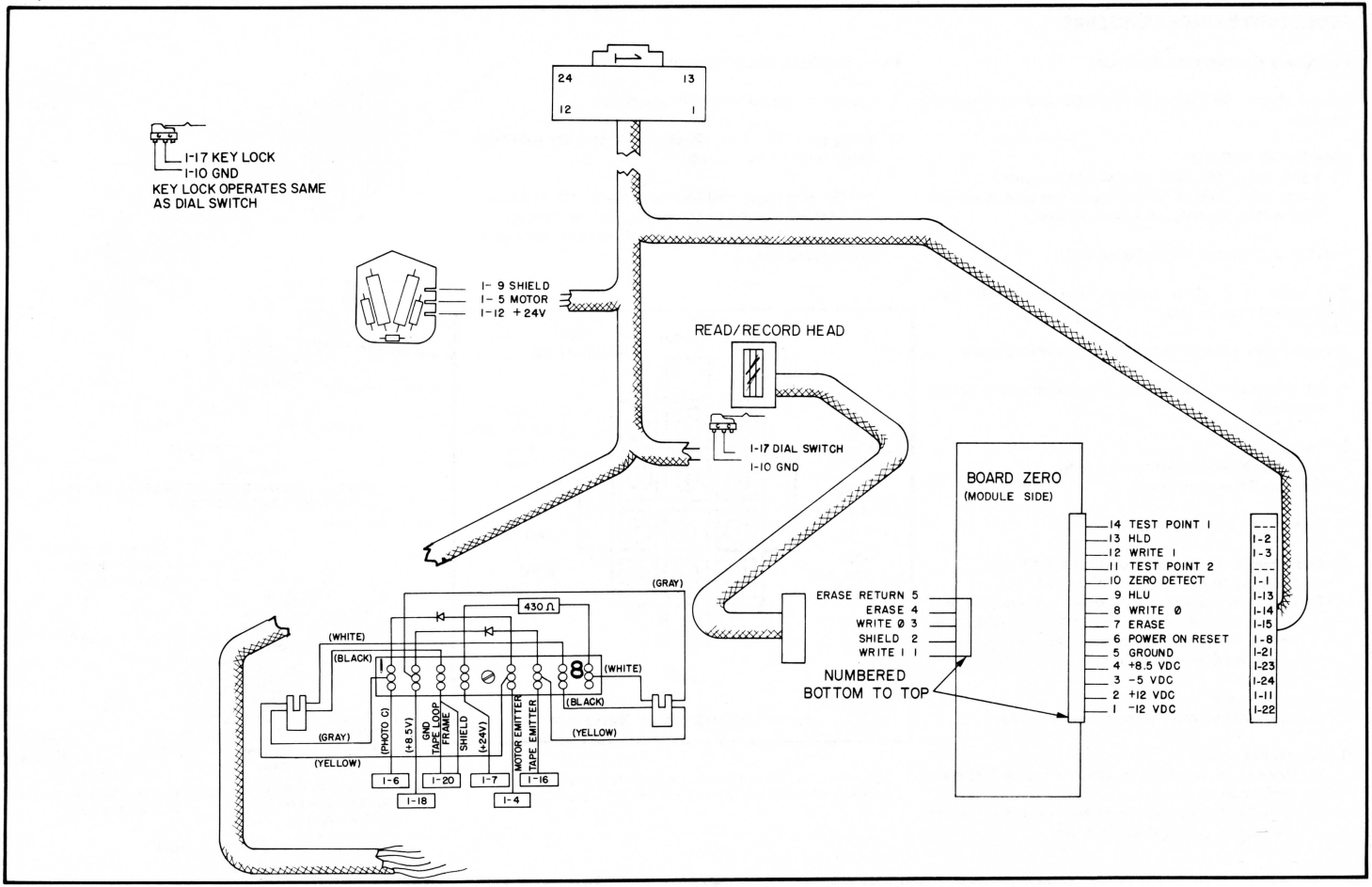
ACTIVE READINGS

4. Head & Board 0

   NOTE: Period of time for meter movement is in direct relationship to the amount of text being STORED OR RECALLED. Track "51" information uses approximately three-fourths of a track.

   Recall (Track "51")
   A. (.8)—(1.8) VAC between pin 14 and ground.
   B. (3)—(4) VDC between pin 13 and ground.
   C. (3)—(4) VDC between pin 9 and ground.

   Store (Track "51") On Another Track
   D. (1.5)—(2) VDC between pin 12 and ground.
   E. (4.5)—(5.5) VDC between pin 7 and ground.


24
13
12
1
I-17 KEY LOCK
I-10 GND
KEY LOCK OPERATES SAME AS DIAL SWITCH
I- 9 SHIELD
I- 5 MOTOR
I-12 +24V
READ/RECORD HEAD
I-17 DIAL SWITCH
I-10 GND
BOARD ZERO
(MODULE SIDE)
14 TEST POINT 1
13 HLD
12 WRITE 1
11 TEST POINT 2
10 ZERO DETECT
9 HLU
8 WRITE Ø
7 ERASE
6 POWER ON RESET
5 GROUND
4 +8.5 VDC
3 -5 VDC
2 +12 VDC
1 -12 VDC
ERASE RETURN 5
ERASE 4
WRITE Ø 3
SHIELD 2
WRITE 1 1
NUMBERED BOTTOM TO TOP
I-2
I-3
I-1
I-13
I-14
I-15
I-8
I-21
I-23
I-24
I-11
I-22
(GRAY)
430 Ω
(WHITE)
(BLACK)
(WHITE)
(BLACK)
(GRAY)
(YELLOW)
(YELLOW)
(PHOTO C)
(+8.5V)
GND TAPE LOOP FRAME
SHIELD
(+24V)
MOTOR EMITTER
TAPE EMITTER
I-6
I-18
I-20
I-7
I-4
I-16

POWER SUPPLY CHECK PROCEDURE

Fuse Check (Voltage With Power On)

Level 1 & 2 – 30 VDC scale, 24 VDC both end caps to ground.

Level 3 – 30 VDC scale
4 amp fuse – 24 VDC both end caps to ground
2 amp fuse – 9.5 to 16 VDC both end caps to ground
If no voltage present, check primary fuse

Fuse Check (Resistance With Power Off)

RX1 scale – 0 ohms between end caps with fuse disconnected from its circuit

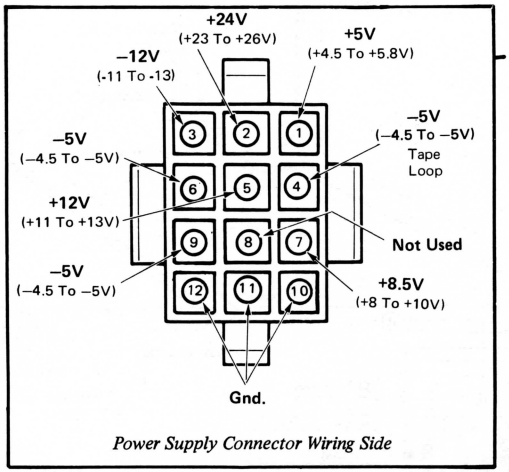
After replacing a blown fuse and before applying power:

1. All power off – disconnect 12 position power supply connector
2. Power on
   A. Fuse blown – replace power supply
   B. Fuse OK – go to step 3
3. Power off
4. Check planar side of power connector RX1 scale
   *A. Check voltage lines for short to pin 12
   *B. Check for voltage lines shorted together. Connect one lead to a voltage line and probe the other voltage lines. Repeat for each voltage line. Note: pins 6 and 9 are common.
5. Short indicated
   Check DC cables, connectors, printer or planar
6. No short indicated
   A. Repeat last operation in progress before fuse blew
   B. Perform quick check
   C. An intermittent short may be detected by tilting the printer, pulling the cables, etc.

Power Supply Connector Output

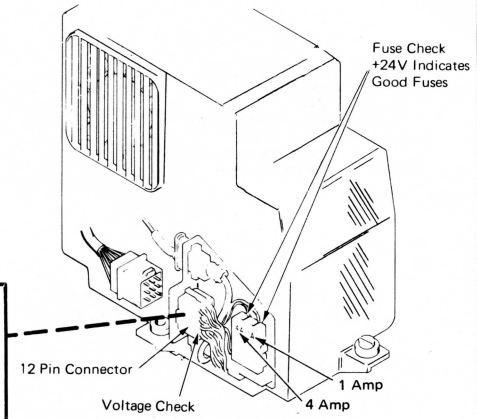
1. Disconnect power supply DC connector
2. Using pins 10, 11 or 12, check voltages for indicated range as shown in drawing

   NOTE: If voltages read low, turn power off, reconnect DC connector and wait 30 seconds. Repeat from step 1. (Power supply may turn itself off without damage if voltage read low.)



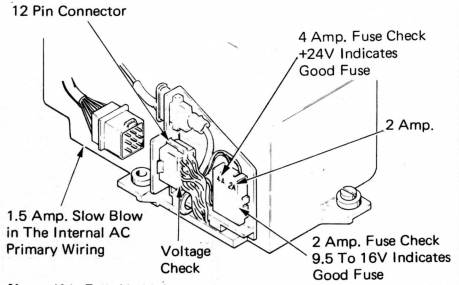
Power Supply Connector Wiring Side

* SOME RESISTANCE READINGS MAY BE MEASURED, BUT SHOULD NEVER BE A DIRECT SHORT (ZERO OHMS)



Power Supply Level 2

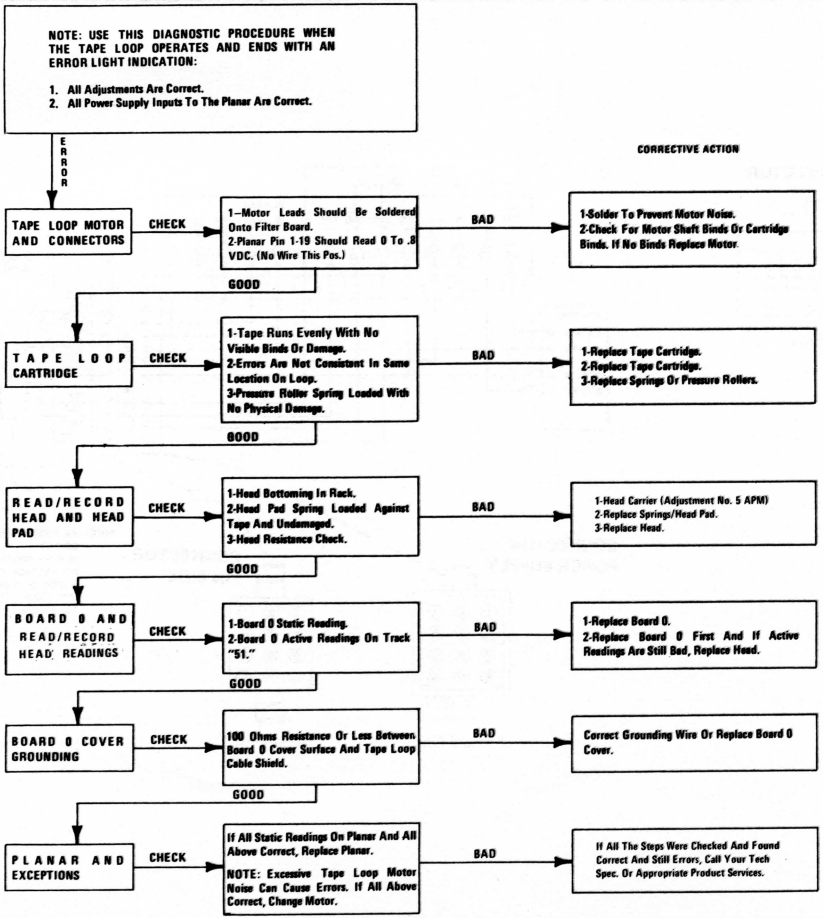
NOTE: L-I POWER SUPPLIES HAVE AN INLINE 4 AMP FUSE UNDER PRINTER



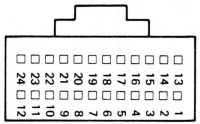
Note: If It Fails No Voltage Will Be Present At Any Output And The Fan Will Run

Note: Must Be The Same At Both Ends Of The Fuse

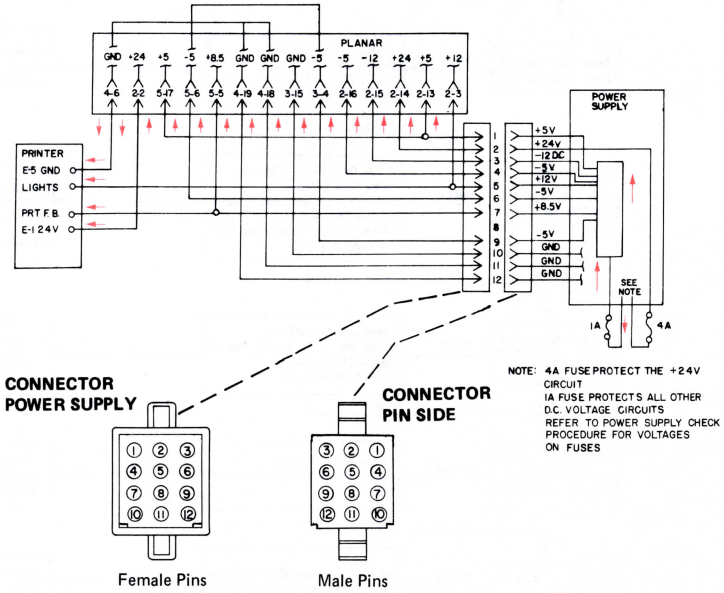
Power Supply Level 3

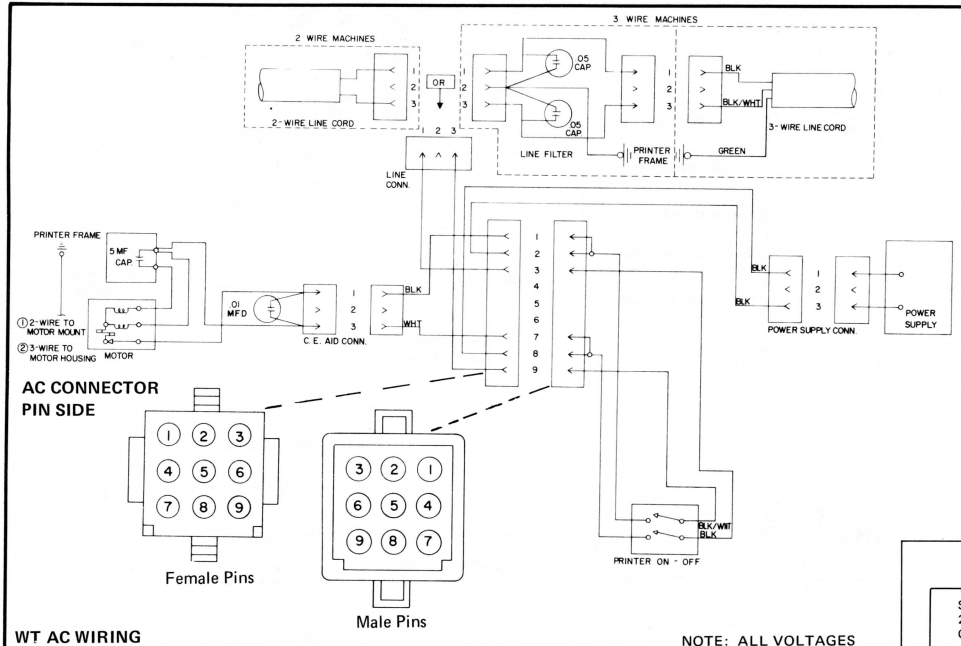

NOTE: USE THIS DIAGNOSTIC PROCEDURE WHEN THE TAPE LOOP OPERATES AND ENDS WITH AN ERROR LIGHT INDICATION:
1. All Adjustments Are Correct.
2. All Power Supply Inputs To The Planar Are Correct.
ERROR
CORRECTIVE ACTION
TAPE LOOP MOTOR AND CONNECTORS
CHECK
1—Motor Leads Should Be Soldered Onto Filter Board.
2-Planar Pin 1-19 Should Read 0 To .8 VDC. (No Wire This Pos.)
BAD
1-Solder To Prevent Motor Noise.
2-Check For Motor Shaft Binds Or Cartridge Binds. If No Binds Replace Motor.
GOOD
TAPE LOOP CARTRIDGE
CHECK
1-Tape Runs Evenly With No Visible Binds Or Damage.
2-Errors Are Not Consistant In Same Location On Loop.
3-Pressure Roller Spring Loaded With No Physical Damage.
BAD
1-Replace Tape Cartridge.
2-Replace Tape Cartridge.
3-Replace Springs Or Pressure Rollers.
GOOD
READ/RECORD HEAD AND HEAD PAD
CHECK
1-Head Bottoming In Rack.
2-Head Pad Spring Loaded Against Tape And Undamaged.
3-Head Resistance Check.
BAD
1-Head Carrier (Adjustment No. 5 APM)
2-Replace Springs/Head Pad.
3-Replace Head.
GOOD
BOARD 0 AND READ/RECORD HEAD READINGS
CHECK
1-Board 0 Static Reading.
2-Board 0 Active Readings On Track "51."
BAD
1-Replace Board 0.
2-Replace Board 0 First And If Active Readings Are Still Bad, Replace Head.
GOOD
BOARD 0 COVER GROUNDING
CHECK
100 Ohms Resistance Or Less Between Board 0 Cover Surface And Tape Loop Cable Shield.
BAD
Correct Grounding Wire Or Replace Board 0 Cover.
GOOD
PLANAR AND EXCEPTIONS
CHECK
If All Static Readings On Planar And All Above Correct, Replace Planar.
NOTE: Excessive Tape Loop Motor Noise Can Cause Errors. If All Above Correct, Change Motor.
BAD
If All The Steps Were Checked And Found Correct And Still Errors, Call Your Tech Spec. Or Appropriate Product Services.

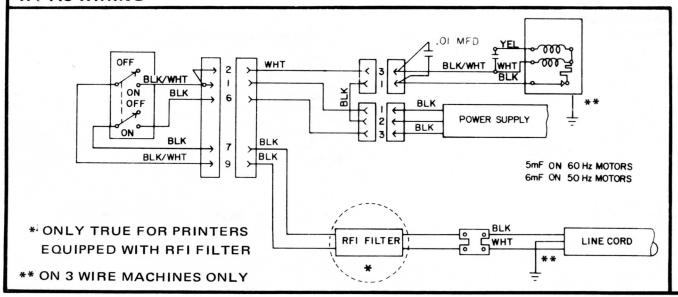
PLANAR BOARD CONNECTOR



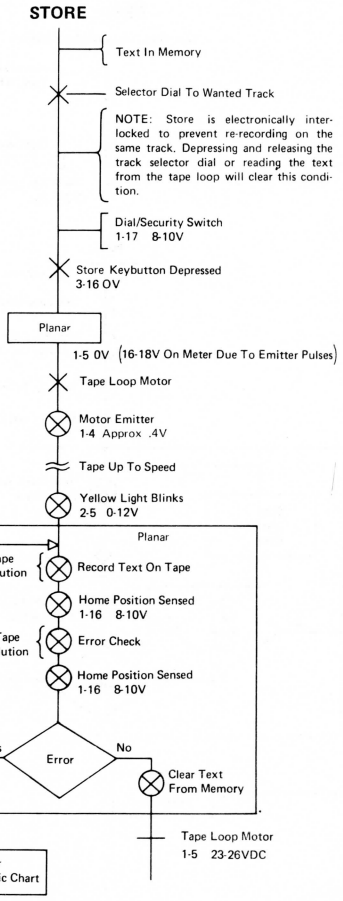
Wiring Side

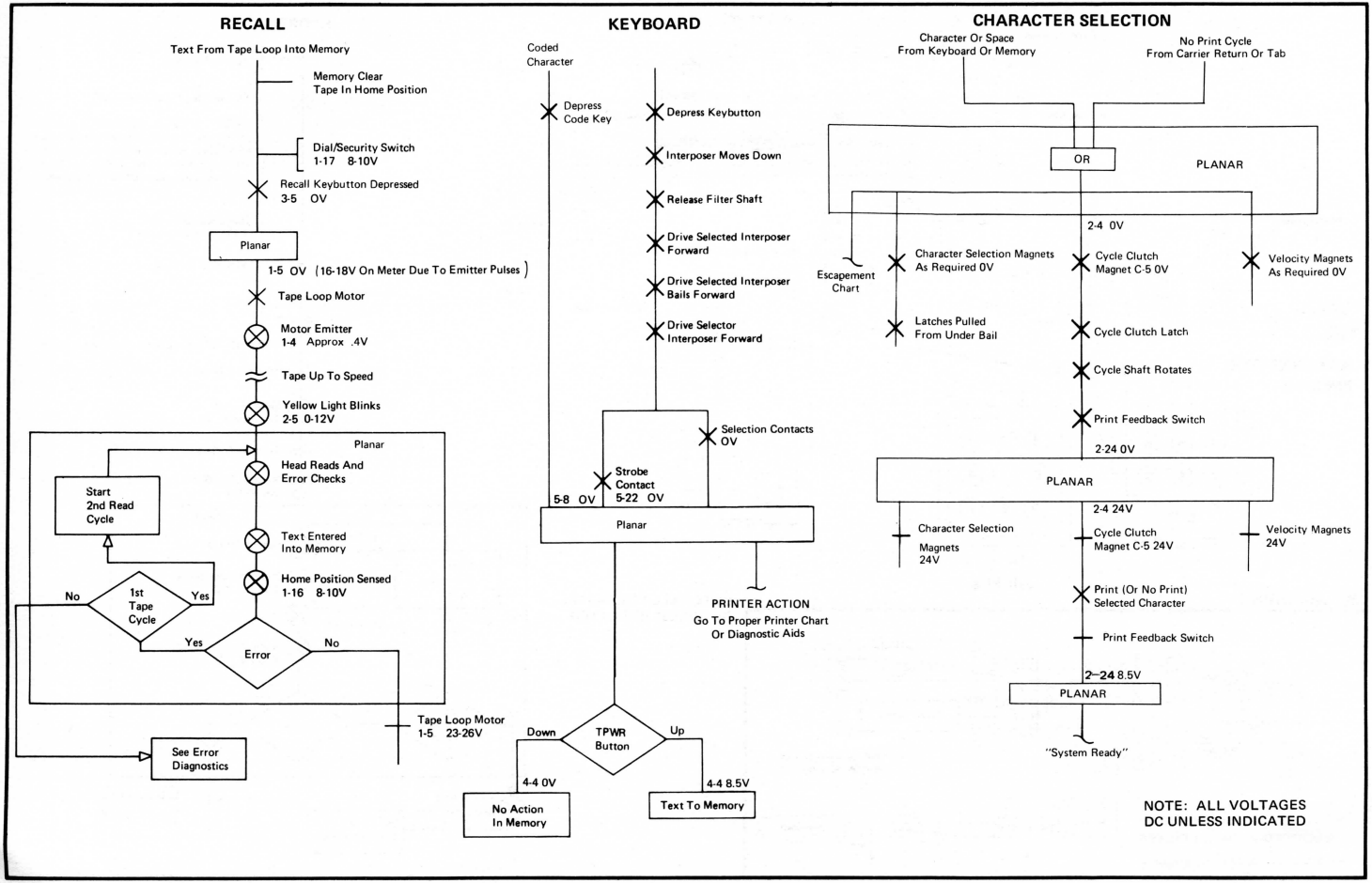




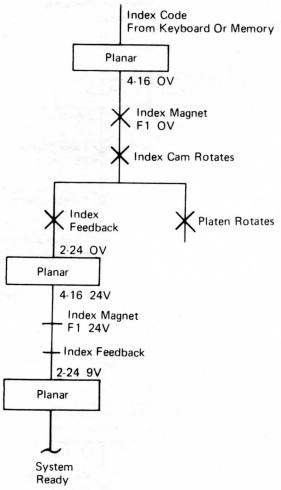


NOTE: ALL VOLTAGES DC UNLESS INDICATED

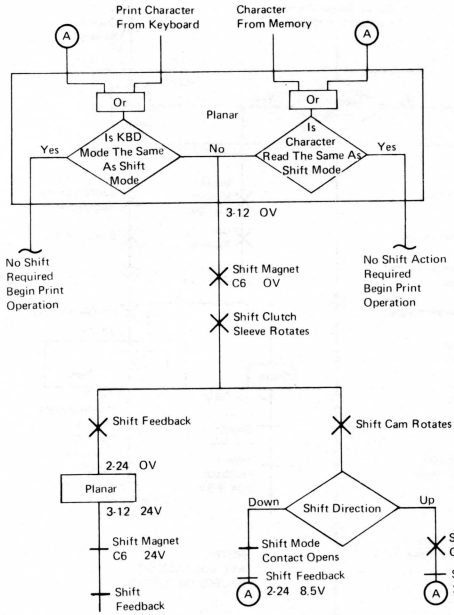



RECALL
Text From Tape Loop Into Memory
Memory Clear
Tape In Home Position
Dial/Security Switch
1-17 8-10V
Recall Keybutton Depressed
3-5 0V
Planar
1-5 0V (16-18V On Meter Due To Emitter Pulses)
Tape Loop Motor
Motor Emitter
1-4 Approx .4V
Tape Up To Speed
Yellow Light Blinks
2-5 0-12V
Planar
Head Reads And
Error Checks
Start
2nd Read
Cycle
Text Entered
Into Memory
Home Position Sensed
1-16 8-10V
No
1st
Tape
Cycle
Yes
Yes
Error
No
Tape Loop Motor
1-5 23-26V
See Error
Diagnostics
KEYBOARD
Coded
Character
Depress
Code Key
Depress Keybutton
Interposer Moves Down
Release Filter Shaft
Drive Selected Interposer
Forward
Drive Selected Interposer
Bails Forward
Drive Selector
Interposer Forward
Selection Contacts
0V
Strobe
Contact
5-22 0V
5-8 0V
Planar
PRINTER ACTION
Go To Proper Printer Chart
Or Diagnostic Aids
Down
TPWR
Button
Up
4-4 0V
4-4 8.5V
No Action
In Memory
Text To Memory
CHARACTER SELECTION
Character Or Space
From Keyboard Or Memory
No Print Cycle
From Carrier Return Or Tab
OR
PLANAR
2-4 0V
Escapement
Chart
Character Selection Magnets
As Required 0V
Cycle Clutch
Magnet C-5 0V
Velocity Magnets
As Required 0V
Latches Pulled
From Under Bail
Cycle Clutch Latch
Cycle Shaft Rotates
Print Feedback Switch
2-24 0V
PLANAR
2-4 24V
Character Selection
Magnets
24V
Cycle Clutch
Magnet C-5 24V
Velocity Magnets
24V
Print (Or No Print)
Selected Character
Print Feedback Switch
2–24 8.5V
PLANAR
"System Ready"
NOTE: ALL VOLTAGES
DC UNLESS INDICATED

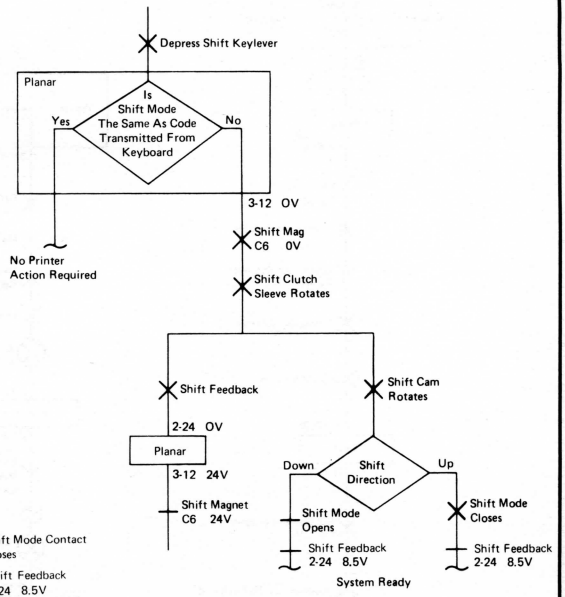
INDEX



PRINTER SHIFT CYCLE

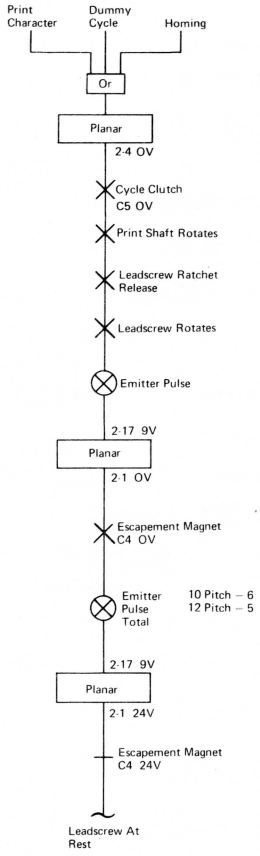


SHIFT CYCLE FROM KEYBOARD

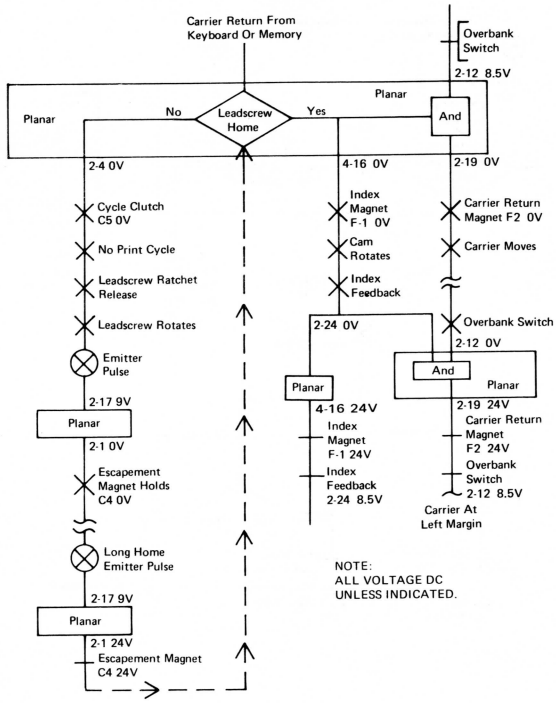


NOTE: ALL VOLTAGES DC
UNLESS INDICATED.

ESCAPEMENT



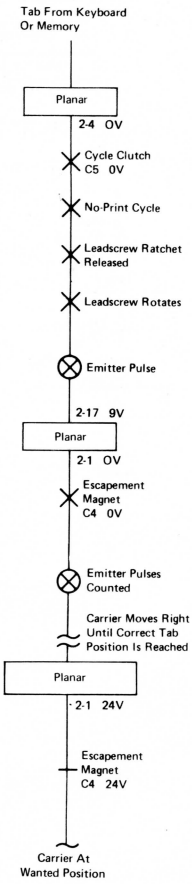
CARRIER RETURN



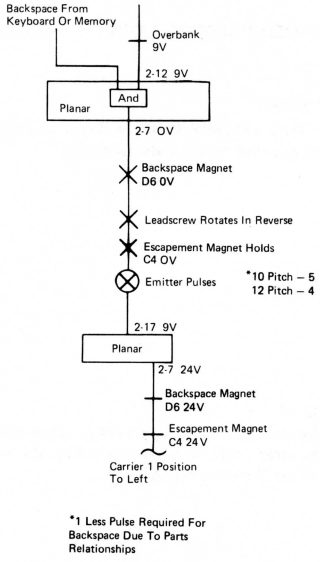
NOTE:
ALL VOLTAGE DC
UNLESS INDICATED.

NOTE: ALL VOLTAGES DC
UNLESS INDICATED.

TAB

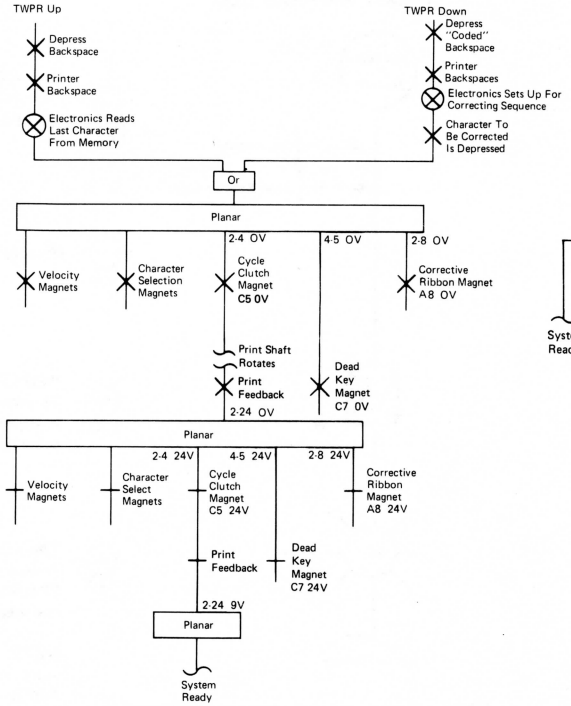


BACKSPACE

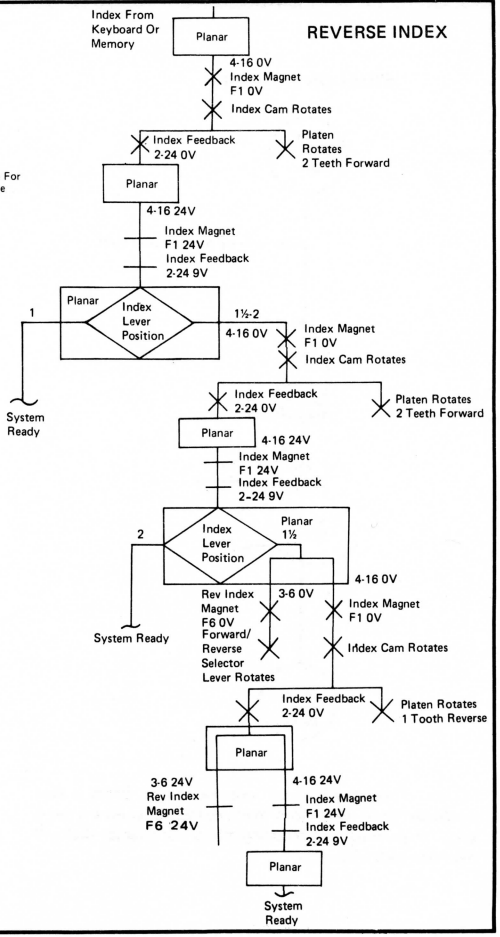


*1 Less Pulse Required For Backspace Due To Parts Relationships

CORRECTING RIBBON CYCLE

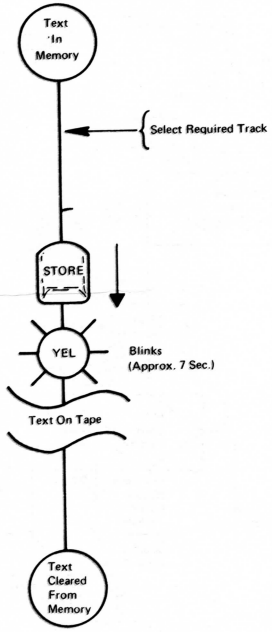


REVERSE INDEX



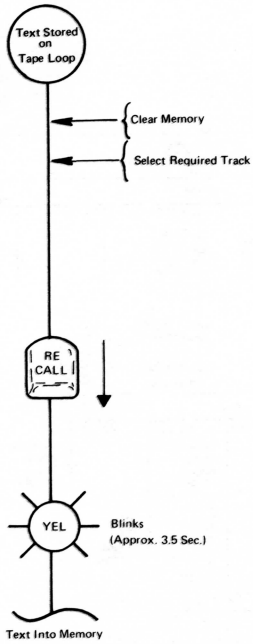
NOTE: ALL VOLTAGES DC UNLESS INDICATED.

STORE ON TAPE LOOP



NOTE: Tape security lever must be to rear. Store is electronically interlocked to prevent re-recording on the same track. Depressing and releasing the track selector dial will clear this condition.

RECALL FROM TAPE LOOP



NOTE: Tape security lever must be to rear (Keylock "On").

LIGHT/ERROR CONDITIONS



YELLOW LIMIT LIGHT

The yellow limit light will blink during a Recall or Store operation showing an active mode of the tape loop.



Memory is full.



RED ERROR LIGHT

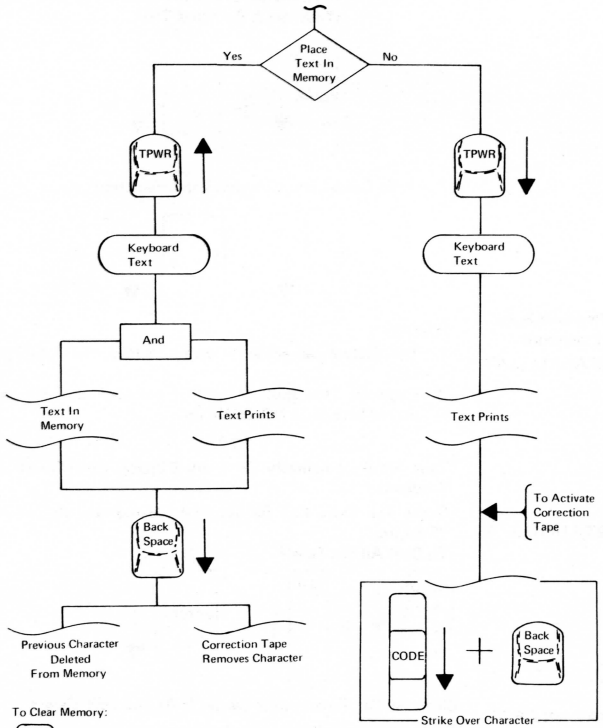
An error in memory causes the red light to blink when Store is depressed. The error must be corrected before the machine will perform the Store instruction.



The solid red light indicates that the memory is positioned at an error. The error can be cleared by depressing Code and Char/Stop. Then use Line Return and playback to identify the missing text.

NOTE: Both lights blinking indicates the material did not store successfully. Depressing the tape loop selector dial during a store operation causes the store operation to be ended. This prevents erasure of other tracks and both lights will blink. By depressing store, the operation will be started once again. When reading a blank tape, loop will make two revolutions, after which red light will come on solid.

KEYBOARD TEXT



NOTE: Centering, word underscore and Dec. Tab are not operative when the TPWR button is down.

WORKING WITH MEMORY

(Function codes, with the exception of Carrier Return, Required Carrier Return, Index and Index Return can be deleted by Backspacing over the code.)

Backspace with TPWR deletes text.

No Zone — Rearranges line endings in memory during playout.

ACCESS BUTTONS

Page Start — Return to previous EOS (record end) code in memory. If there are no EOS Codes, return to the beginning of text.

PAR ADV — Advance memory to beginning of next paragraph. *

LINE ADV — Advance memory to beginning of next line.

LINE RET — Position memory to previous carrier return.

* Paragraph Identification—
2 Or More Carrier Returns
Carrier Return/Tab
Carrier Return/Space(s)
Required Carrier Return
Index Return

DELETE FUNCTIONS

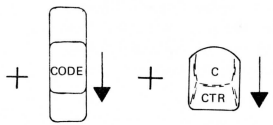
CODE + LINE DEL — Deletes a line of text. If the memory is positioned in the middle of a line, the text remaining in that line and the carrier return will be deleted.

CODE + WORD DEL — Deletes a word or function code. (When deleting a word, the function code following the word is also deleted.)

CODE + CHAR DEL — Deletes a character or function code.

TO CENTER

Tab Or Space To Point Which Text Will Be Centered Around



Keyboard Text To Be Centered

+

Depress Carrier Return, Tab, Word Underscore Instruction, Index, Index Return, Required Carrier Return or Required Backspace to print the centered text.

NOTES:

1. If you make an error while keyboarding text to be centered, BACKSPACE one time. This positions the carrier to the point where you began keyboarding the text to be centered and positions the memory back to the center instruction.
2. To correct an error after the center text prints, delete the line and retype the complete line.

TO UNDERSCORE CENTERED TEXT

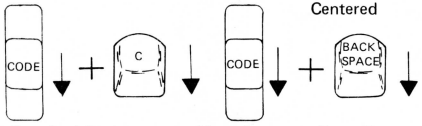
Use required space to type the text to be centered.

Enter the WORD UNDERSCORE instruction at the end of the last centered word.

TO UNDERSCORE SINGLE WORDS IN A CENTERED LINE

Tab or Space to the Center Point

Type the Text to be Centered



Type Required Backspaces to Move Carrier to First Character in Line

+

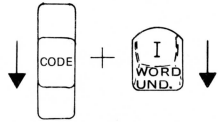
Type the Underscores

+

Carrier Return

WORD UNDERSCORE

Type the Word to be Underscored



The Machine Will Backspace Until It Finds:

A Space
A Tab
A Carrier Return, Index, Return,
Another Word Underscore Instruction
A Required Backspace

TO UNDERSCORE SEVERAL WORDS:

Type The Text To Be Underscored, Using Required Spaces — Then Follow The Instructions For Word Underscore

TO UNDERSCORE A WORD THAT IS SEPARATED AT THE END OF A LINE:

Type The First Part Of The Word
Type A Word Underscore Instruction
Type A Hyphen & Carrier Return
Type The Rest Of The Word
Type A Word Underscore Instruction

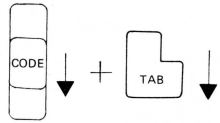
TO UNDERSCORE A WORD CONTAINING A REQUIRED HYPHEN:

Type The First Word
Type A Word Underscore Instruction
Type The Required Hyphen
Type The Next Word
Type Another Word Underscore Instruction

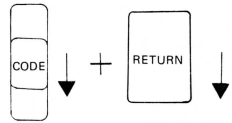
WHEN PLAYBACK STOPS FOR HYPHENATION OF AN UNDERSCORED WORD:

Play By CHAR To The End Of A Syllable
Type A Word Underscore Instruction (The Machine Will Underscore The First Part Of The Word)
Type A Hyphen
Depress AUTO

REQUIRED TABS (PARAGRAPH INDENT) (To Enter A Required Tab)



To Cancel The Required Tab Instruction:



NOTES:

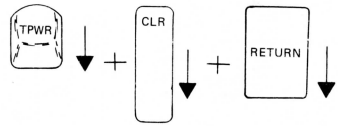
1. The System can allow for up to 14 Required Tabs Per Line
2. Required Tabs must be used if indented text will be played back with NO ZONE up

TAB

Tabs Are Automatically Set Every 5 Spaces When Power Is Turned On.

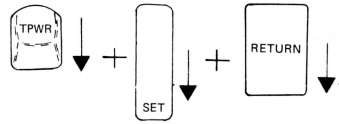
Single Tab Stops Can Be Set And Cleared Just As On A "Selectric"

To CLR All Set Tabs =

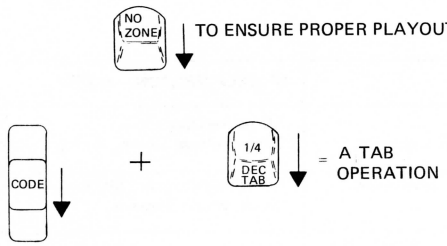


Clears All Set Tabs Even If Carrier Is At The Left Margin.

To Reset 5 Space Tabs =



DECIMAL TAB



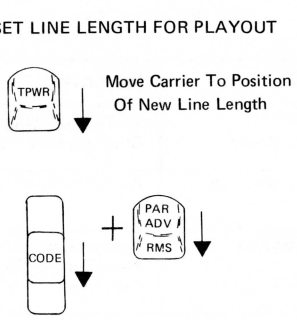
Carrier will B/S one time for each figure keyboarded until the decimal point is typed. Entering another Dec Tab instruction or depressing either of the following will cause the figure to print.

CR	Index Return
TAB	
WORD UNDERSCORE	Required CR
Required Backspace	

NOTES:

1. If an error is made while keyboarding the figures, BACKSPACE one time. The carrier will be positioned to the Tab Stop and the memory will be positioned back to the DEC TAB instruction in memory.
2. To correct an error after the figure prints, line delete and retype the line.
3. The machine does not detect the upper case period as a decimal point.

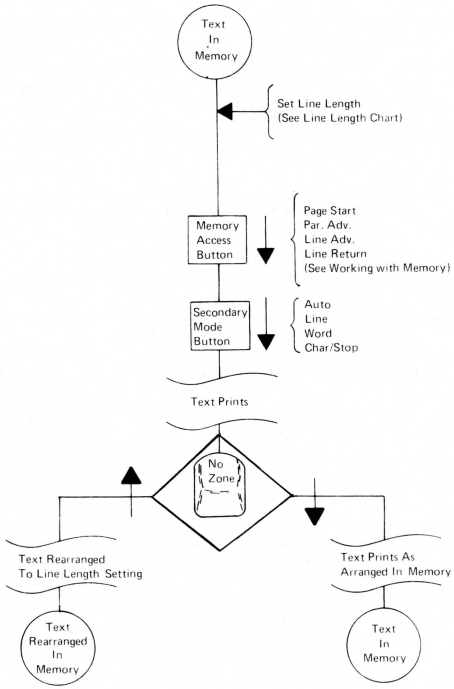
LINE LENGTH



NOTES:

1. A 6" line length is set every time the machine is turned on. This line length is set for hyphen scan.
2. If the left margin setting is changed, the 6" line length will be maintained, and moved with the left margin setting.
3. If the pitch lever is moved, with the carrier away from the left margin, during playout, that line of print will be extended by the distance the carrier is from the left margin.

PLAYBACK



NOTE: Carrier Must Be At Left Margin When Pitch Lever Is Changed

QUICK CHECK
PERFORM EACH STEP IN SEQUENCE
SET UP: "Entry" Up

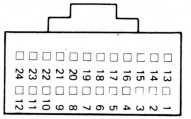
	PROCEDURE	MACHINE REACTION	INDICATION	IF MALFUNCTION — GO TO
1.	"Power" Switch On "Printer" Switch Off	Power Supply Fan "On" Condition Light Blinks Slowly	AC To Power Supply—OK Ground & 8.5V To Printer—OK Light—OK	AC Wiring Diagram Static Voltage Check, Wiring Diagram
2.	Turn On "Printer" Switch	Printer Motor "On"—Light Stops Blinking	AC To Printer—OK Printer On Sensor—OK	AC Wiring Diagram, Static Voltage Check, Wiring Diagram
3.	Functionally Check Keyboard, Using All Three Pitches, "Tab Loc," "Tab Set" and "Tab Cir"	Printer Reacts As Keyboarded	Keyboard/Associated Electronics/Printer—OK Power Supply—OK Pitch Selector—OK	Applicable Keyboard Function Chart, And/Or Escapement Function Chart, Static Voltage Check, Wiring Diagram
4.	Operate "Alt Sect"	C/Ret Or Dummy Cycle	"Alt Sect"—OK	Voltage Check, Wiring Diagram
5.	Select Available Section Of Memory Latch Down "Entry" Enter Format/Line Length Code B/S One Time Depress "Auto"	 No Reaction Format Prints In Left Margin, 64 Prints At Line End Zero Index C/Ret No Reaction	 "Code"—OK "Line Length Set"—OK "Error Correct B/S"—OK	Voltage Check, Wiring Diagram
6.	"Code" + "D," "T"	Dummy Cycle, Condition Light On For 30 Sec. Then Second Dummy Cycle	"Demo Text" Retrieval—OK	Voltage Check, Wiring Diagram
7.	Machine In 1/84p Depress "Par Adv" Depress "Line Adv" Depress "Line Ret" Depress "Char" Depress "Word" Depress "Line" Depress "Auto"	No Reaction Dummy Cycle Dummy Cycle Dummy Cycle "N" Prints "ow" Prints & Carrier Spaces Rest Of Line Prints Several Lines Print Out, Stops For Line End Decision On "Calculation—,"—Bell Rings	 "Par Adv"—OK "Line Adv"—OK "Line Ret"—OK "Char"—OK "Word"—OK "Line"—OK "Auto"—OK "Bell"—OK	Voltage Check, Wiring Diagram
8.	Depress "Word"	C/Ret	"Hyphen Reject"—OK	Voltage Check

PROCEDURE	MACHINE REACTION	INDICATION	IF MALFUNCTION — GO TO
9. Depress "Sect Start" Release "Entry" Depress "Auto"	Dummy Cycle No Reaction Demo Text Prints Out In "Final"	"Sec Start"—OK System—OK	Voltage check, Wiring Diagram
10. "Code" + "D," "A" Install Gauge Font—Perform Print Quality Check	Dummy Cycle, Condition Light On For 15 Sec. Then Second Dummy Cycle	"Demo Alignment" Retrieval—OK	Voltage Check, Wiring Diagam Print Quality Diagnostics
11. Mark Tooth On Each Index Ratchet And Identify A Reference Point. Perform Indexing Check	Ratchet Revolutions Mode Left Right 3 0 3 4 1 0 5 1 1 6 1 2 7 1 3 8 2 0 9 2 1 10 2 2 11 2 3 12 3 0 13 3 1 14 3 2 15 3 3 16 4 0 17 4 1 18 4 2	Index Selection—OK	Index Function Chart, Index Adjustments, Voltage Check, Wiring Diagram
12. Paper Feed—Leading: 18, Impression: 1, UN-11-B Font a. Type 3 Lines Of "Em" Dashes, Then Repeat C/R Until 3 Inches From Bottom Of Page. Roll Back & Type A "Z" Just Above The First Line & At Each End. b. Impression: 6, Type Full Rows Of "Z's" Over The Following Lines	 The 2 "Zs" Are Equal Distance From The Dashes No Change In Parallel Condition Between The "Em" Dashes & The "Zs"	 Paper Control & Feed—OK	Paper Feed Adjustments

PLANAR PACKAGE VOLTAGE CHECK

All voltages are DC ± 10%. All static readings are taken with the printer and system on, the printer and keyboard in lower case, entry and alt. sect. keybuttons up, pitch selector to 1/84 pitch and end of ribbon sensor held down.

PLANAR BOARD CONNECTOR



WIRING SIDE

POSITION NO. 1 PLANAR BOARD CONNECTOR

PIN	STATIC	ACTIVE	NAME	TERMINATES
1	+24	0	Shift Mag.	C-8
2	+24	0	R2A Solenoid	A-5
3	+24	0	Bell Mag.	B-8
4	+12	0	1/96 Pitch Mag.	E-7
5	+8.5	0	Condition Light	At Light
6	+24	0	Cycle Clutch	C-5
7	+24	0	Med. Vel. Mag.	G-2
8	+24	0	T2 Solenoid	A-7
9	*0 Ohms	*0 Ohms	Sig. Gnd. (To Planar)	PS-12
10	+12	0	1/72 Pitch Mag.	E-5
11	+24	0	Low Vel. Mag.	G-3
12	*+24	*+24	+24 (To Planar)	PS-2
13	+24	0	Carrier Ret. Mag.	C-6
14	+24	0	R2 Solenoid	B-6
15	+24	0	R5 Solenoid	B-5
16	+12	0	1/84 Pitch Mag.	E-6
17	+24	0	Index Mag.	C-7
18	+24	0	Backspace Mag.	G-4
19	+24	0	R1 Solenoid	B-7
20	*0 Ohms	*0 Ohms	Mag. Gnd. (To Planar)	PS-10
21	+24	0	T1 Solenoid	A-6
22	+24	0	Deadkey Mag.	F-8
23	*+8.5	*+8.5	+8.5 (To Planar)	PS-7
24	*-5	*-5	-5 Sense (To Planar)	PS-9

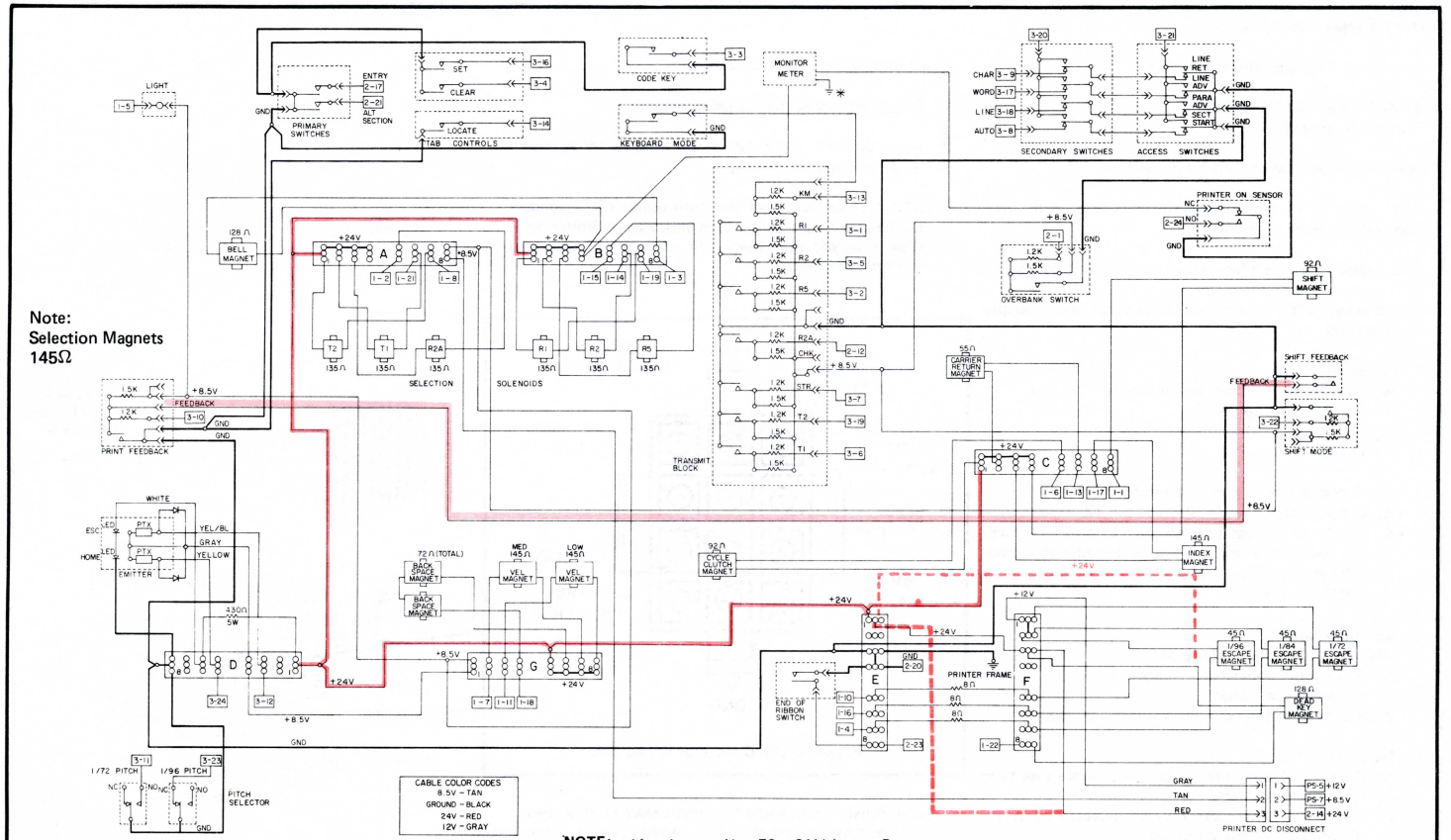
POSITION NO. 2 PLANAR BOARD CONNECTOR

PIN	STATIC	ACTIVE	NAME	TERMINATES
1	+8.5	0	Overbank Sw.	At Sw.
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12	+8.5	0	R2A Cont.	Trans. Blk.
13	*+5	*+5	+5 (To Planar)	PS-1
14	+24	+24	+24 (To Printer)	PD-3, F-3
15				
16	*-5	*-5	-5 (To Planar)	PS-6
17	+8.5	0	Entry	At. Sw.
18				
19				
20	*0 Ohms	*0 Ohms	Gnd. (To Printer)	E-4
21	+8.5	0	Alt. Section	At. Sw.
22				
23	+8.5	0	End Of Ribbon	E-8
24	+8.5	0	Printer On Sensor	At. Sw.

POSITION NO. 3 PLANAR BOARD CONNECTOR

PIN	STATIC	ACTIVE	NAME	TERMINATES
1	+8.5	0	R1 Cont.	Trans. Blk.
2	+8.5	0	R5 Cont.	Trans. Blk.
3	+8.5	0	Code Key	At. Sw.
4	+8.5	0	Tab Clear	At. Sw.
5	+8.5	0	R2 Cont.	Trans. Blk.
6	+8.5	0	T1 Cont.	Trans. Blk.
7	+8.5	0	Strobe Cont.	Trans. Blk.
8	0	+8.5	Auto	At. Sw.
9	0	+8.5	Char.	At. Sw.
10	+8.5	0	Feedback	At. P. Fbk. Sw.
11	0	+7	1/72 Pitch Sw.	At. Sw.
12	0	+8.5	Emitter — Esc.	D-3
13	+8.5	0	Keyboard Mode	Trans. Blk.
14	+8.5	0	Tab Locate	At. Sw.
15	*0 Ohms	*0 Ohms	Sig. Gnd (To Planar)	PS-11
16	+8.5	0	Tab Set	At. Sw.
17	0	+8.5	Word	At. Sw.
18	0	+8.5	Line	At. Sw.
19	+8.5	0	T2 Cont.	Trans. Blk.
20	+8.5	0	Secondary Switches	At. Sw.
21	+8.5	0	Access Switches	At. Sw.
22	+8.5	0	Shift Mode	At. Sw.
23	0	+7	1/96 Pitch Sw.	At. Sw.
24	0	+8.5	Emitter — Home	D-5

* ..... POWER SUPPLY INPUTS
PD ..... PRINTER DC DISCONNECT CONNECTOR
PS ..... POWER SUPPLY CONNECTOR
A–G ..... PRINTER TERMINAL BLOCKS



NOTE: After Approx. Nov. 76 — 24 V Jumper Between E — 1 And F — 3 Removed.

Dead Key Magnet Wire To F8 & E1 Printer DC Disconnect Red Wire To E — 1 Instead Of F3.

* Monitors With One Wire Are Internally Grounded To Frame

Monitor Not Used in WT

Power Supply Check Procedure

Fuse Check (Voltage With Power On)

30 VDC scale — 24 VDC both
End caps to ground

Fuse Check (Resistance With Power Off)

RX1 scale — 0 ohms between end caps with fuse disconnected from its circuit

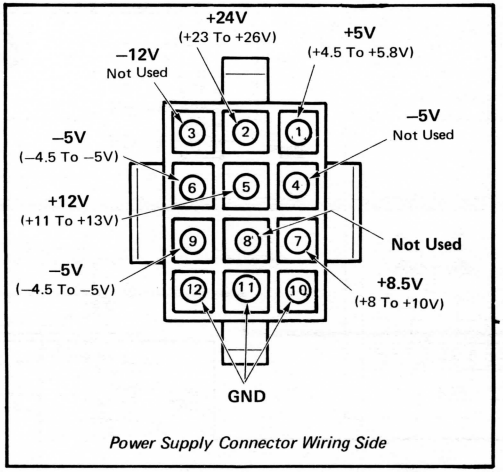
After replacing a blown fuse and before applying power:

1. All power off — disconnect 12 position power supply connector
2. Power on
   A. Fuse blown — replace power supply
   B. Fuse OK — go to step 3
3. Power off
4. Check planar side of power connector RX1 scale
   *A. Check voltage lines for short to pin 12
   *B. Check for voltage lines shorted together. Connect one lead to a voltage line and probe the other voltage lines. Repeat for each line line. Note: pins 6 and 9 are common.
5. Short indicated
   Unplug DC disconnect connector
   A. Short still indicated — short is in DC cable, connectors or planar
   B. Short not indicated — short is in the printer
6. No short indicated
   A. Repeat last operation in progress before fuse blew
   B. Perform quick check
   C. An intermittent short may be detected by tilting the printer, pulling the cables, etc.

Power Supply Connector Output

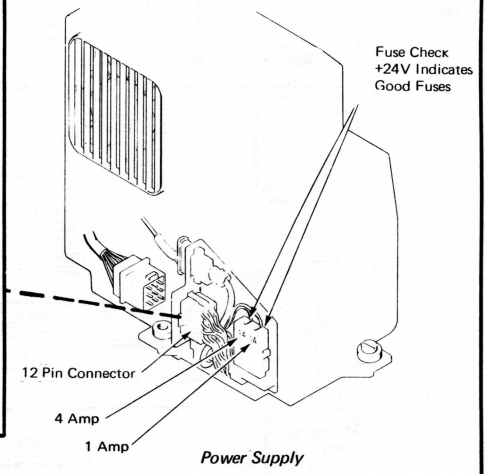
1. Disconnect power supply DC connector
2. Using pins 10, 11 or 12, check voltages for indicated range as shown in drawing.

   NOTE: If voltages read low, turn power off, reconnect DC connector and wait 30 seconds. Repeat from step 1. (Power supply may shut itself off without damage if voltages read low.)

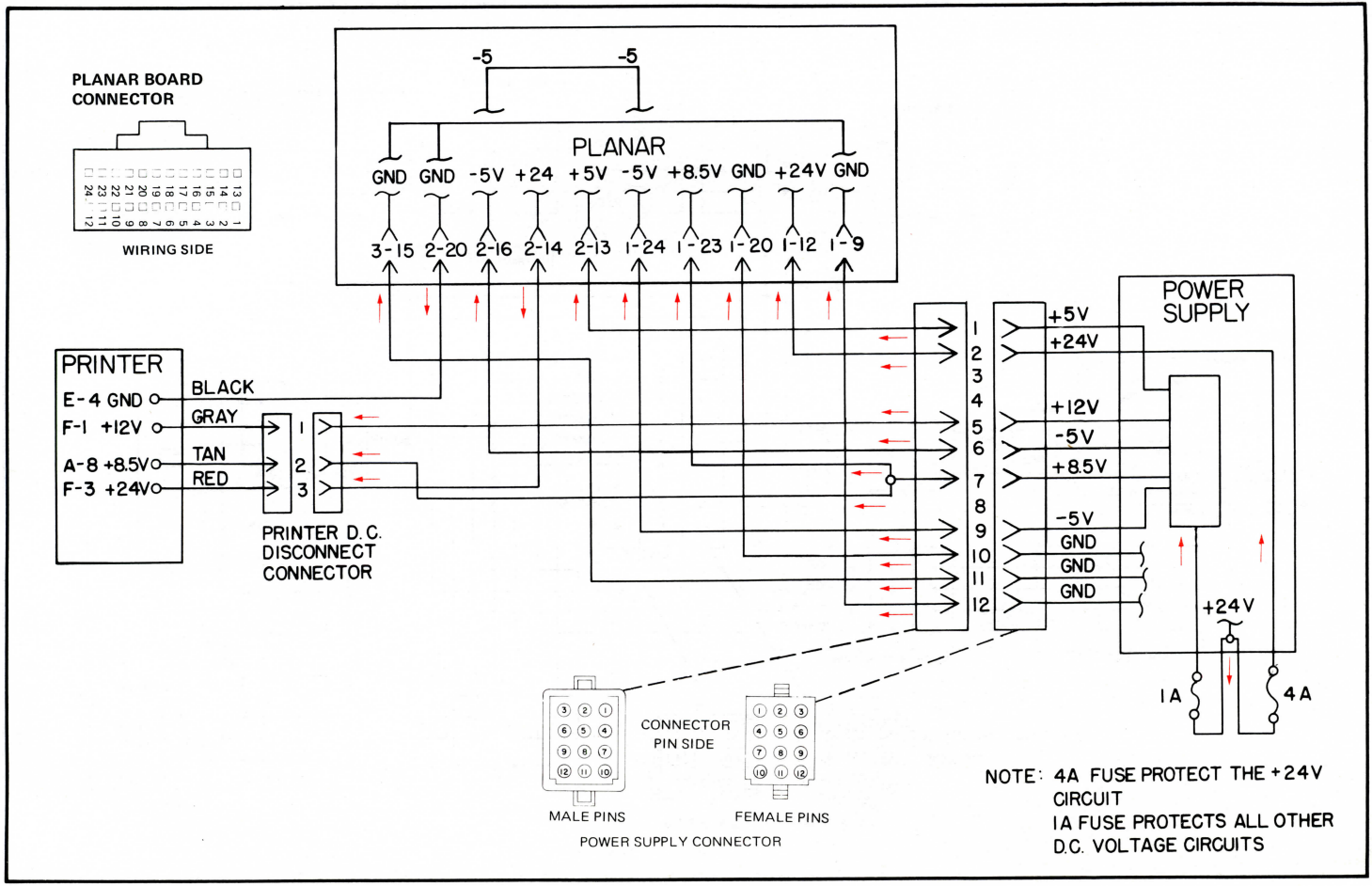


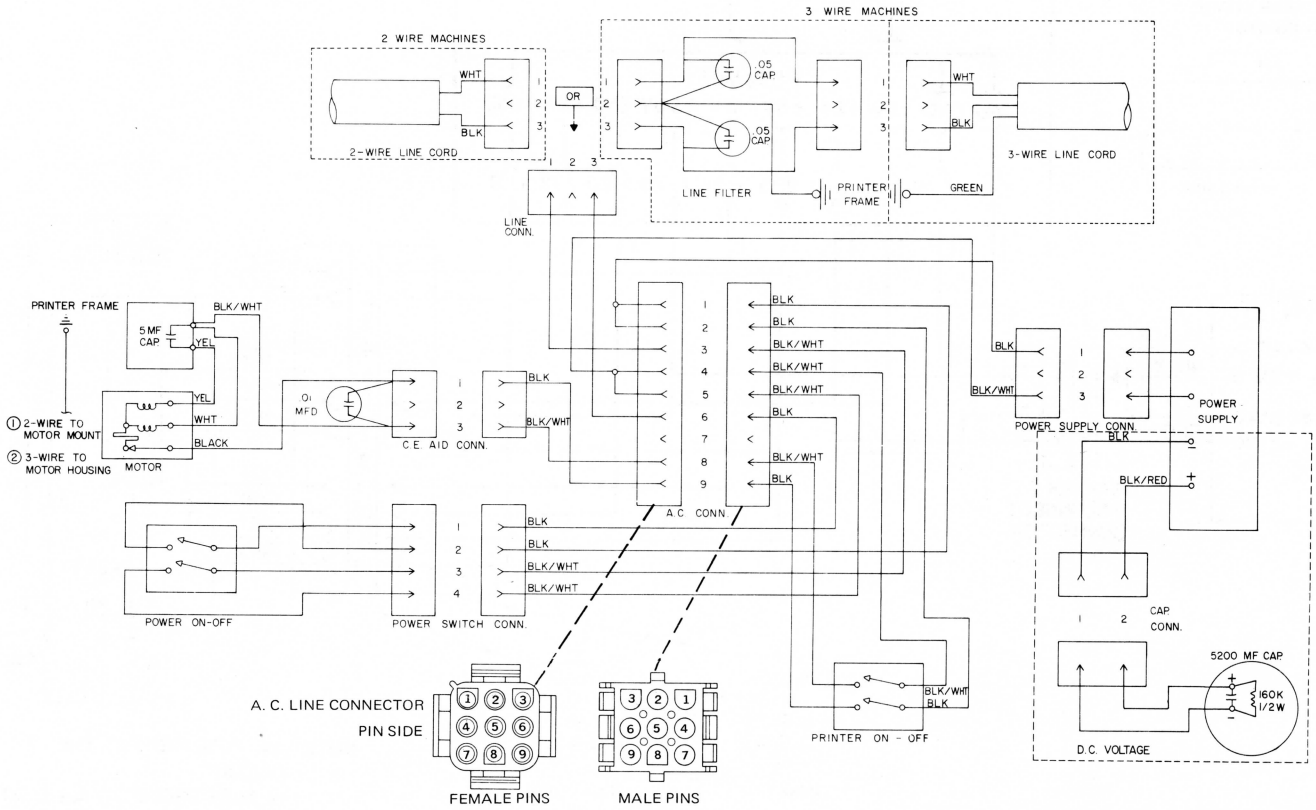
Power Supply Connector Wiring Side

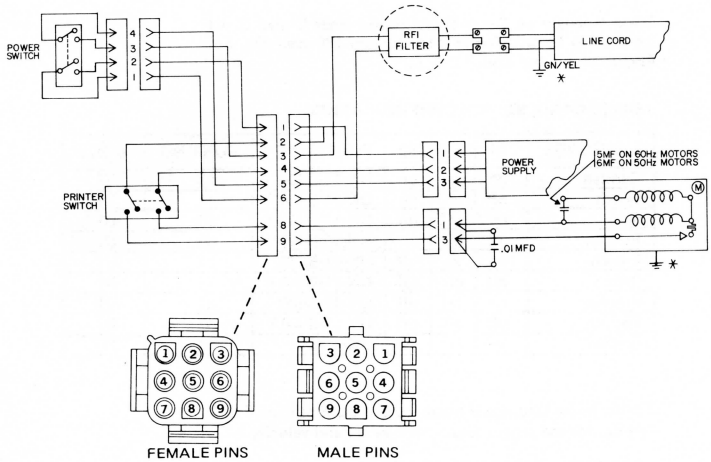
*NOTE: SOME RESISTANCE READINGS MAY BE MEASURED, BUT SHOULD NEVER BE A DIRECT SHORT (ZERO OHMS)

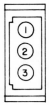


Power Supply


PLANAR BOARD CONNECTOR
WIRING SIDE
-5
-5
PLANAR
GND GND -5V +24 +5V -5V +8.5V GND +24V GND
3-15 2-20 2-16 2-14 2-13 1-24 1-23 1-20 1-12 1-9
PRINTER
E-4 GND
F-1 +12V
A-8 +8.5V
F-3 +24V
BLACK
GRAY
TAN
RED
1
2
3
PRINTER D.C. DISCONNECT CONNECTOR
1 2 3 4 5 6 7 8 9 10 11 12
+5V
+24V
+12V
-5V
+8.5V
-5V
GND
GND
GND
POWER SUPPLY
+24V
1A
4A
CONNECTOR PIN SIDE
MALE PINS
FEMALE PINS
POWER SUPPLY CONNECTOR
NOTE: 4A FUSE PROTECT THE +24V CIRCUIT
1A FUSE PROTECTS ALL OTHER D.C. VOLTAGE CIRCUITS


2 WIRE MACHINES
3 WIRE MACHINES
WHT
BLK
2-WIRE LINE CORD
OR
.05 CAP
.05 CAP
LINE FILTER
PRINTER FRAME
GREEN
WHT
BLK
3-WIRE LINE CORD
LINE CONN.
PRINTER FRAME
5 MF CAP
BLK/WHT
YEL
YEL
WHT
BLACK
① 2-WIRE TO MOTOR MOUNT
② 3-WIRE TO MOTOR HOUSING
MOTOR
.01 MFD
C.E. AID CONN.
BLK
BLK/WHT
A.C. CONN.
BLK
BLK
BLK/WHT
BLK/WHT
BLK/WHT
BLK
BLK/WHT
BLK
POWER SUPPLY CONN.
BLK
BLK/WHT
POWER SUPPLY
BLK
BLK/RED
CAP CONN.
5200 MF CAP
160K 1/2W
D.C. VOLTAGE
POWER ON-OFF
POWER SWITCH CONN.
BLK
BLK
BLK/WHT
BLK/WHT
PRINTER ON - OFF
BLK/WHT
BLK
A. C. LINE CONNECTOR
PIN SIDE
FEMALE PINS
MALE PINS

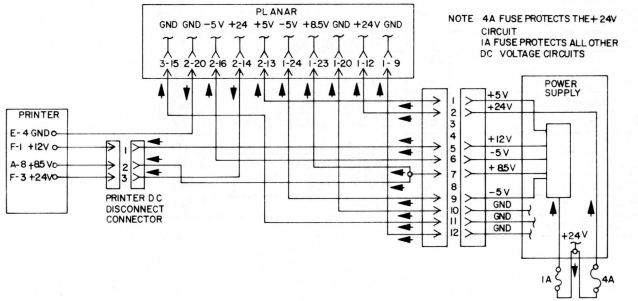




FEMALE CONNECTOR MALE PINS			
PIN	WIRE	NAME	TERMINATES
1	12	+12 VDC	"F" BLOCK
2	17	+8.5 VDC	"A" BLOCK
3	64	+24 VDC	"F" BLOCK

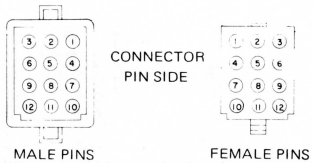


MALE CONNECTOR FEMALE SOCKETS			
SOCKET	WIRE	NAME	TERMINATES
1	65	+12 VDC	P S 5
2	32	+8.5VDC	P S 7
3	11	+24VDC	PLANAR 2-14



* ON 3 - WIRE MACHINES ONLY

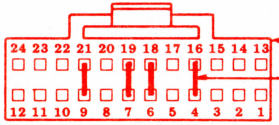
POWER CONNECTOR		
PIN	WIRE	NAME
1	1	+5VDC
2	2	+24VDC (P/N 1466721)
3		
4		
5	65	+12VDC (TO PRINTER)
6	4	–5VDC
7	(57.32)	+85VDC (TO PRINTER)
8		
9	27	SENSE
10	21	MAG GROUND
11	35	SIG GROUND
12	36	SIG GROUND



POWER SUPPLY CONNECTOR

ELECTRONIC COMPOSER PIN JUMPER CHART

COUNTRY OR LANGUAGE GROUP	KEYBOARD CODE	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
BRAZIL	372																X		X	X		X			
LATIN–CANADA FRENCH	152																X					X			
LATIN–ENGLISH	154																X					X			
LATIN–DUTCH	916																X					X			
FRANCE	370																X								
GERMANIC	976														X		X					X			
HUNGARIA	376																X		X	X					
LATIN–ITALIAN	955																X					X			
FRANCE/LATIN	978																X					X			
NORDIC	975														X					X					
POLAND	398																X			X					
PORTUGAL	373														X		X		X	X		X			
ROMANIA	399														X		X		X	X					
USSR	396																			X					
LATIN–SPANISH	952																X					X			
TURKEY	427														X		X			X					
UNITED KINGDOM	974																								
USA	973																								
YUGOSLAVIA	378																X		X						
YUGOSLAVIA CYRIL	384														X		X		X						
USA–WORLD TRADE	501													NO JUMPER REQ'D											



CONNECTOR P/N 1149901

JUMPER P/N 1461052

Typical example for keyboard no. 372.
This connector plugs onto planar socket 7.

WORLD TRADE – DEMONSTRATION AID

Select language on Demo Switches and enter Coded D – I for text to be transferred into Memory (30 seconds). For English text, enter Coded D – T.

DEMO CARD, SWITCH CONFIGURATION

LANGUAGE	S1	S2	S3	FONT TYPE	FONT NO.	CODE
German	on	on	on	UN-11-B-GE	43	DI
Dutch	off	on	on	UN-11-B-LAT	41	DI
Swedish	on	off	on	UN-11-B-NOR	50	DI
Russian	off	off	on	UN-10-B-RUS	80	DI
French	on	on	off	UN-11-B-FR	33	DI
Italian	off	on	off	UN-11-B-LAT	41	DI
Brazilian	on	off	off	UN-11-B-BR	61	DI
Spanish	off	off	off	UN-11-B-LAT	41	DI
English	—	—	—	UN-11-B	64	DT

If other home language is required, key the font code F & 2 digit no. for the proper escapement values and velocity.

FONT IDENTIFICATION NUMBERS

France	33	Press Wire Font	57
Yugoslavia	37	Tech. Composition	60
Yugoslavia Cyrillic	39	Brazil	61
Latin & French Latin	41	Technical Font	62
Germanic	43	Portugal	63
Bold/Light A/C	45	US & UK	64
Mathematics Font	46	Coppl. Gothic D. C.	68
Poland	49	Coppl. Gothic Fraction	72
Nordic	50	Ruling Font	76
Turkey	51	Coppl. Gothic	79
Hungarian	53	Russian (Cyr. or Lat.)	80
Romanian	55	ABA	84
Greek Symbol	56		

"SYSTEM BUSY"
(Keyboard Cycles With No Printer Reaction)

1. With the "entry" button unlatched, turn the "printer switch" OFF and check to see if the condition light is blinking slowly
   .....YES–Go to step 2.
   NO:
   On "solid" ..... Go to step 4.
   Off:
   A. Check the printer "DC disconnect" service connector for good contact.
   B. Is the power supply fan running?
   ..... YES–Go to step 2A.
   NO–Check the AC wiring to the power supply.
2. Turn the "printer switch" to ON and the condition light should go out.
   .....YES–Go to step 3.
   NO:
   A. Check the "printer on" sensor switch.
   B. Check the planar connectors for good contact.
   If system is still "busy" ..... Go to step 4.
3. Operate the keyboard to see if the system is still "busy."
   ..... YES–Go to step 4
   NO:
   A. Operate the keyboard until it becomes "busy" again.
   B. Use the proper function chart to diagnose the malfunction.
4. Perform a Static Check of the power supply inputs to the planar:

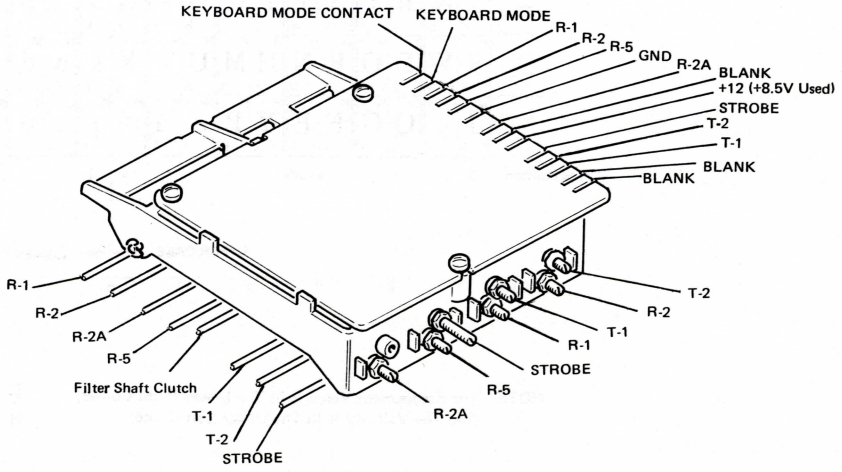
1.	1-9 GND	5.	1-24 -5V
2.	1-12 +24V	6.	2-13 +5V
3.	1-20 GND	7.	2-16 -5V
4.	1-23 +8.5V	8.	3-15 GND

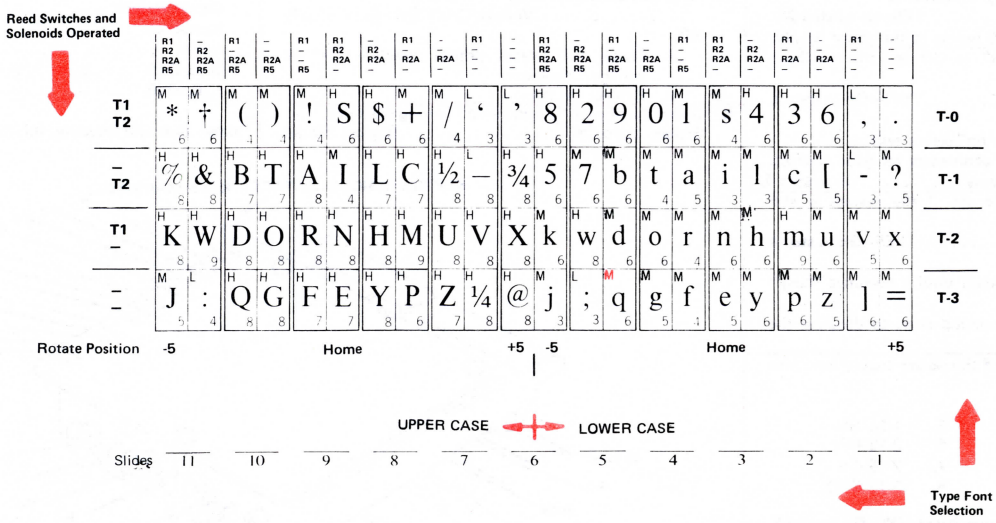
   ..... Power Supply OK–Go to step 5.
   NO:
   Use power supply diagnostics to check the power supply and fuses.
   A. If power supply checks OK, check the cable from the power supply to the planar.
   B. If the cable checks OK, replace the planar.
5. Hand cycle a character and check Planar 3-7 (strobe) for a change from a static level of 8.5V to an active level of 0V
   ..... YES–Go to step 6
   NO–Check the keyboard transmit board and wiring.
6. Check Planar 3-10 (feedback) for a static level of 8.5V
   .....YES–Go to step 7.
   NO–Check the printer feedback circuit (wiring diagram).
7. Perform a complete Planar Voltage Check
   .....Voltage Check OK–Go to step 8.
   NO:
   A. Check the related printer function for the voltage differences.
   B. Replace the planar.
8. Check the printer "ground loop" (wiring diagram).
   Ground Loop OK .....Replace Planar.

Functions:

Space	T1, T2, R5
*Tab	T2, R2, R5
Carrier Return	T2, R1, R2, R5
Backspace	R2, R5
Index	R1, R2, R5
U. C. Shift	T2, R5
L. C. Shift	R5

*Note: Solenoid Selection for Tab is T1, R2 and R5.

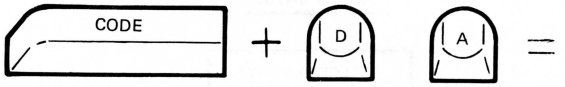




NOTE: The Escapement Value Is In The Lower Right Corner, And The Velocity Is In The Upper Left Corner.

L — Low Velocity
M — Medium Velocity
H — High Velocity

PRINT QUALITY DIAGNOSTICS



= **DEMO ALIGNMENT PROGRAM PLACED IN MEMORY**

MACHINE SET UP: Install gauge font, stick position 1, margin at 10, set a tab at 37, 1/84 pitch, 8-1/2 X 11 paper (clay coated if available), lengthwise position 5, leading 10.

1 **MWMWM** **MWMWM** **MWMWM**

2 !"#$%&'()*+,-./0123456789:;<=>?@

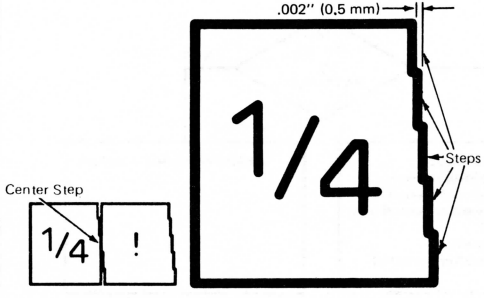
3 [\]^_`abcdefghijklmnopqrstuvwxyz{|}~

4 ¡¢£¤¥¦§¨©ª«¬®¯°±²³´µ¶·¸¹º»¼½¾¿ÀÁÂÃÄÅÆÇÈÉÊËÌÍÎÏÐÑÒÓÔÕÖ×ØÙÚÛÜÝÞßàáâãäåæçèéêëìíîïðñòóôõö÷øùúûüýþÿ

5 ¼ ½ ¾ ⅓ ⅔ ⅛ ⅜ ⅝ ⅞ ¼ ½ ¾ ⅓ ⅔ ⅛ ⅜ ⅝ ⅞

6 ss*8*8!1!1(9(9/6/6 GgGgQqQqPpPpYyYy

7 rusinouseanilrsnetion



Perfect Horizontal Alignment *Gauge Block*

Line 1: **COVERAGE** — Check for even coverage. All characters in this line should appear evenly colored (though voids occur) from top to bottom and side to side. This indicates the quality of the platen and if the platen and yoke positions are correct. The gauge font has a UN-8-L period to allow the manual impression check. A final coverage test should be made in stick position 6 using the customer's largest font (UN-11-B; M & W) to check for voids.

Line 2: **SQUARENESS** — Check the vertical alignment between the upper and lower case characters. This line checks the squareness of the font and upper ball socket. If a squareness problem exists, a sine wave pattern would appear as each rotate position is printed in proper sequence. This character sequence makes the effect of the sine wave more visible. The first two characters show the head clearance effect and the remaining characters show the effect in upper and lower case tilt zero positions.

Line 3: **VERTICAL ALIGNMENT** — Check the base line of the gauge blocks to ensure that each block is typed on the same plane. Misalignment by the thickness of the base line is allowed only if it occurs from time to time on a casual basis. Misalignment of any gauge block by more than the thickness of the base line is not allowed. The characters in this line check tilt angles by comparing the tilt characters within the same rotate position.

Line 4: **HORIZONTAL ALIGNMENT** — Check the vertical "stepped" line between the gauge blocks. The center step of each block should align with the straight vertical line on the left-hand edge of the following block. This condition ensures correct horizontal alignment. The steps on the gauge blocks are offset by .002" (0.05 mm). If more than one gauge block in this test line is off .004" (0.10 mm) (two steps) or more, the horizontal alignment is not correct.

Line 5: **PRINT CONSISTENCY** — Check this line for a constant print impact. An upper case +5 rotate character (3/4) is repeated across the line because it causes the greatest load on the print system.

Line 6: **SMEAR** — Check the characters in this line for smear or "double image." The first group of characters are tilt zero positions, considered most likely to smear. Compare the second group of tilt 3 characters with the first group. Quality adjustments and parts should produce clean copy for the tilt zero characters. The tilt 3 characters reflect the effect of "typehead bending" which is a characteristic of the single element printer. If the tilt zero row is clean and the tilt 3 row is excessively smeared, improvement can only be made by reducing the impression or replacing the tilt ring or font. Some smear will always occur on fonts of small point size and will be better visible where excessive impression exists. For this reason coverage, impression and smear must be reviewed together.

Line 7: **CHARACTER COMBINATIONS** — Check the characters in this line for "letter fit," "line weight," or "alignment" problems. The character combinations in this line are considered most likely to show these problems. Problems seen here should be compared against the previous test lines to determine if mechanical problems exist. The "stop code" that comes before line 7 allows you to set the correct escapement and/or impression for the font you are checking.

LINE 1
COVERAGE

RIBBON

PAPER

FONT

IMPRESSION

LIGHT OR VOIDS

1. *Temperature below 60 degrees F (16° C).
2. Incorrect platen position.
3. Incorrect yoke position.
4. Incorrect velocity ratio.
5. Incorrect velocity selection.
6. Front rail adjustment.
7. Carrier clamp adjustment.
8. Cycle clutch drive.
9. Bind in gear train.
10. Loose drive belt.
11. Shift spring dragging. (check both cases)
12. Lubrication on tilt ring backup shoe or type font skirt.
13. Rocker upstop interference.
14. Rocker return spring tension excessive.
15. Ribbon feed or lift.
16. Binding or bent print shaft.
17. Rocker binding. (not centered)
18. Binding print sleeve.
19. Platen indented or pitted.
20. Cardholder interference with font.

HEAVY OR EXCESSIVE IMPRESSIONS

1. *Temperature over 94 degrees F. (34° C). Check rubber planar to power supply seal and power supply fan.
2. Incorrect velocity ratio.
3. Loose drive belt.
4. Loose print cam follower stud.
5. Weak rocker return spring.

LINE 2
SQUARENESS

DEFECTIVE FONT?
(font substitution)

FOREIGN MATERIAL IN UPPER BALL SOCKET?
(clean and re-lube)

DEFECTIVE TILT RING?
(replace tilt ring)

LINE 3
VERTICAL ALIGNMENT

IS THERE ANY PATTERN?

NO

1. Tilt detent – loose or binding.
2. Tilt ring side play (pre-load) or binds.
3. Rear carrier shoe – excessive clearance.
4. Upper ball socket – excessive vertical play.
5. Rocker play (pre-load).
6. Detent cam – lateral position.
7. Detent cam follower bracket – vertical position.

YES

1. Defective tilt ring – replace.

*Optimum temperature is 75 to 85 degrees F (24-29°C).

LINE 4

HORIZONTAL ALIGNMENT



CARRIER MOVEMENT

1. Rear carrier shoe — binds.
2. Front carrier rail — binds.
3. Mainspring tension and lubrication.
4. Leadscrew binds (bearings, center support, leadscrew shoe, outboard support, drive gears).
5. Leadscrew Drive assembly — weak or inconsistant.
6. Transport cords and pullys — binds.
7. Carrier return and tab pinion gears — binds.
8. Escapement shaft — binds.
9. Carrier return shoe contacting carrier return spring clutch.
10. Carrier clamp out of adjustment.
11. Print shaft shield interference or binding pulleys.
12. Cardholder interference with platen or feed rolls.
13. Print shaft — lubrication or surface damage.

CARRIER AND ROCKER

1. Rotate detent — loose or binding.
2. Tilt ring side play (pre-load.
3. Rocker play (pre-load).
4. Upper ball socket — excessive lateral play (over .001" (0.03 mm)).
5. Detent skirt clearance.
6. Detent cam lateral position.
7. Detent cam follower bracket.
8. Print shaft timing.
9. Print sleeve — excessive end play (over .003" (0.08 mm)).

LINE 5

PRINT CONSISTANCY

CHECK LIGHT IMPRESSION
LEG ON CHART 1

LINE 6

SMEAR

1. *Temperature over 94 degrees F. (34° C) Check rubber planar to power supply seal and power supply fan.
2. Incorrect velocity ratio.
3. Platen position.
4. Rocker return spring weak.
5. Rear carrier shoe adjustment.
6. Rear carrier shoe spring tension weak.
7. Front rail and carrier clamp adjustment.
8. Rocker play (pre-load).
9. Detent cam follower bracket height.
10. Tilt ring (pre-load).
11. Tilt or rotate detents — loose or binding.
12. Rear carrier rail — loose screws.
13. Print shaft — bent.
14. Upper ball socket — dirty (loosen the upper ball socket adjusting screw, flush and relubricate and readjust the tilt ring).
15. Tilt and rotate detents and upper ball socket too tight — not enough play.
16. Paper bail clearance — with or without indicator rings.
17. Replace tilt ring assembly.
18. As a last step, it is sometimes necessary to replace the carrier and rocker assembly.

LINE 7

CHARACTER COMBINATIONS

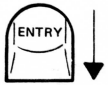
COMPARE PREVIOUS GAUGE FONT LINES TO ISOLATE PROBLEM TO THE MECHANICS OF THE MACHINE OR TO THE TYPE FONT.

FONT

1. Use font substitution to compare alignment.

***OPTIMUM TEMPERATURE is 75 to 85 degrees F (24–29°C)**

PRIMARY BUTTONS



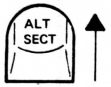
"ENTRY" MODE

Material can be entered into, played out from, or corrected in memory after a format/line length code has been entered.

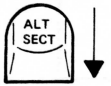


"FINAL" MODE

Material in memory will play out, determined by instruction codes, in a "final" state. Nothing can be entered into memory. Keyboard and printer function normally.



MAIN SECTION

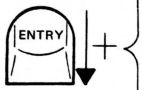


ALTERNATE SECTION

The memory can store 8,000 characters, functions or codes. It can be separated into 2 addressed sections, the "Main" section and the "Alternate" section. The system will address the Main section of memory until the Alternate section keybutton is latched down. The Alternate section will begin where the material in the Main section ends. If material is added to the Main section, it will cause the Alternate section to move down in memory. When returning to a section, the same position in memory will be addressed as when that section was last used.

Note: Depressing or releasing the Alternate section button will cause the printer to dummy cycle or carrier return as a feedback signal.

ACCESS BUTTONS





Return to the beginning of memory in the selected section.



Advance memory to the beginning of the next paragraph. *



Advance memory to the beginning of the next line.

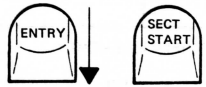


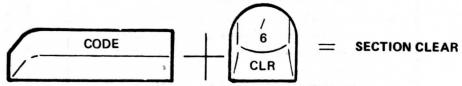
Position memory at the beginning of the line. If at the beginning of the line, return memory to the beginning of the previous line.

SECTION CLEAR

Section Clear Procedure:

1. Latch "Entry" keybutton down.
2. Select memory section to be cleared: Main section or Alternate section.
3. Depress "Section Start" keybutton.
4. Enter a "Coded 6" (code button plus the 6-CLR keybutton).





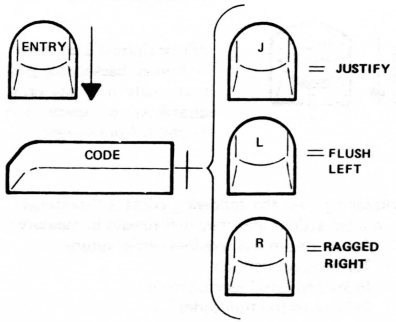
Note: The printer will zero index carrier return to indicate that a Section Clear Operation has been performed.

*Paragraph Identification:
Multiple Carrier Returns
Carrier Return/Tab
Carrier Return/Space(s)
Required Carrier Return
Index Return

ENTERING TEXT INTO MEMORY

In order to enter text into either section of memory, the entry key must be latched down and a "Basic Format" and a "Line Length" keyed into the system. There are three basic formats, "Justify" (Coded "J"), "Flush Left" (Coded "L"), and "Ragged Right" (Coded "R"). Keying a basic format will cause a "J," "L," or "R" to print four units to the left of the margin and the system will be in a "Line Length Set" mode. A line length is then entered by positioning the carrier (tab, space, backspace or key any character) to the wanted line length and keying a carrier return. This sets a tab at the line length, prints out the active font identification and returns the carrier without indexing. The system is now ready for text.

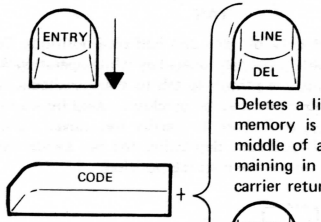
BASIC FORMATS



NOTE:

1. When additional formats and/or line lengths are to be entered:
   A. The carrier must be at the left margin or indent level.
   B. Enter the format — the carrier will tab to the current line length and stop.
   C. The current line length may be retained by keying a carrier return or a new line length entered by repositioning the carrier and keying a carrier return.
2. "Character Delete" or "Backspace" will delete both the format and the line length (See — Delete Functions).

DELETE FUNCTIONS



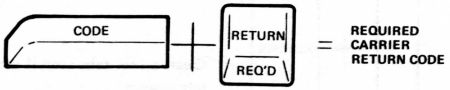
Deletes a line of text. If the memory is positioned in the middle of a line, the text remaining in that line and the carrier return will be deleted.

Deletes a word or function. When deleting a word, the function code following the word is also deleted.

Deletes a character, function, or format/line length code. (A format/line length code is considered one code.)

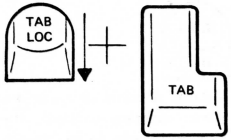
REQUIRED CARRIER RETURN

Required carrier return is used to cancel required tab and also to prevent a carrier return from being changed to a space during automatic line end corrections in "Entry" playback. A required carrier return is considered a paragraph break when using "Paragraph Advance" to advance in memory.



TAB

Tabs can be set only on pica and half pica positions. Depressing and holding the tab locate key while operating the tab key will cause the printer to tab to every available tab position. Tab positions may be quickly located by operating the tab key, and when the carrier has moved to the approximate tab position, depressing the tab locate key. The carrier will stop at the next tab position.

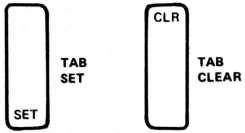


= TAB LOCATE

Printer tabs to available tab positions.

Tab locate is active only in "Final" and "Line Length Set" modes.

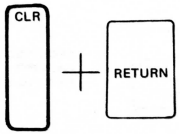
TAB SET AND CLEAR



Printer will "Dummy" cycle when a tab has been set or cleared.

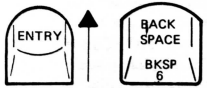
To prevent entering unwanted material into memory, tabs should be set and cleared only in "Final" mode.

TO CLEAR ALL SET TAB STOPS

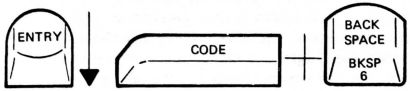


Clears all set tabs even if carrier is at the left margin.

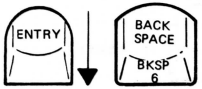
BACKSPACE



= Printer backspaces 6 units — No changes to memory.



= "'Backspace 6 Code" placed in memory — The printer backspaces 6 units.



= "Error Correct Backspace" — Printer backspaces proportionally over any print character or space and deletes it from memory.

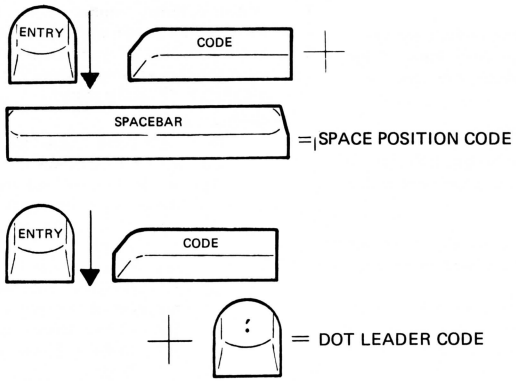
NOTE:

1. Backspacing over the following codes is "Inhibited" (no printer action) and they will remain in memory.
   - A. Carrier return and required carrier return
   - B. Tab and required tab
   - C. Index and zero index c/return
   - D. Column instruction codes

2. Backspacing over the following codes will delete them from memory and give the following printer response:

Backspace 1 Unit	Space 1 Unit
Backspace 6 Units	Space 6 Units
Stop	"Dummy" Cycle
Format/Line Length	Zero Index C/Ret
Line Format Instruction	Backspace Proportionally
No Print	Backspace 3 Picas

LINE FORMAT INSTRUCTION CODES



Line Format Procedure:

Flush Left

1. Text
2. Line format code

Flush Right

1. Line format code
2. Text

Center

1. Line format code
2. Text
3. Line format code

Flush Left and Flush Right

1. Flush left text
2. Line format code
3. Flush right text

Flush Left, Center and Flush Right

1. Flush left text
2. Space position code
3. Flush right text
4. "Coded Index" (zero index return)
5. Space position code
6. Text to be centered
7. Space position code

LINE FORMAT INSTRUCTIONS

SPACE POSITION CODE
DOT LEADER CODE

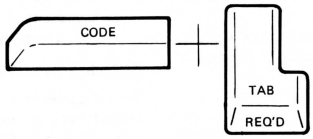
Line format codes, space position codes (Coded "Spacebar") and dot leader codes (Coded "Period"), are in effect for one line only. Space position codes may be used to flush right, flush left, center or compound lines. The code will be expanded to fill the difference between the text entered and the line length.

Dot leader codes (Coded "Period") are used in the same way as space position codes, except that the space is filled with dot leadering.

A space position symbol (;), dash over comma, will print when a space position code is entered into memory, and a (˙) dash over period, will print for a dot leader code.

REQUIRED TAB (PARAGRAPH INDENT)

The required tab feature allows the system to make automatic line end corrections during "Entry" playback of indented material. Required tab (Coded "Tab") should only be used when a complete paragraph or section of the job is indented from the margin. Required tabs are entered on the first line of a section to be indented to automatically indent the carrier the proper number of tabs for all following lines. Current indent level should be cancelled before changing to a new indent level. A required carrier return (Coded "Carrier Return") should be entered at the end of the indented section to cancel the required tab. Required tab is active in both "Entry" and "Final" modes.



LINE END DECISIONS

The Electronic "Selectric" Composer expands the space to "Justify" and "Ragged Right" text. When keying text in these two formats, the bell rings when a "Quality Check" is met. A "Quality Check" is met when the carrier is 36 units or less from the line length and the system can "Justify" the text entered without expanding any spaces between words over 12 units. The word being typed when the bell rings should be completed and the carrier returned. If the word cannot be completed before reaching the line length, the keyboard will become inoperative. A decision must then be made to either: (1) backspace to a syllable, hyphenate and carrier return, or (2) carrier return and retype the complete word on the next line.

There are times when a "Quality Check" cannot be met. For example: the last line of a project or paragraph. If the Quality Check is not met, the "Final" playout will expand the spaces between words on that line until they fill the line length. To "Flush Left" the short line, either end with paragraph identification (2 or more c/ret; c/ret and tab or required c/ret) or a space position code.

WHEN ENTERING TEXT INTO MEMORY

1. Text is being keyed into memory.
2. The bell rings:
   - A. Justify or ragged right text — when the Quality Check is met.
   - B. Flush left or line format text — when the carrier is exactly 36 units from the line length.
3. Complete the word being keyed and carrier return — if the word cannot be completed, the keyboard becomes inoperative at the line length. Either:
   - A. Backspace to a syllable, type a hyphen and carrier return.
   - B. Carrier return and retype the complete word on the next line. (The partial word at the end of the line will be dropped.)

DURING "ENTRY" PLAYBACK

When changes have been made to material in memory (additions, deletions, changes to format or line length, or different escapement), new lines end decisions are necessary. Line endings are changed by playing back stored text in "Entry."

In "Justify" and "Ragged Right," line endings are determined automatically by the Quality Check logic. If the Quality Check cannot be met, playback will stop for a hyphenation decision.

"Entry" Playback Hyphenation Procedure:

1. A partial word prints to the line length, followed by an "em" dash (—) and the carrier backspaces to the beginning of a word.
2. Either:
   - A. Depress "Auto" — The carrier will return and the complete word will be placed on the next line.
   - B. Playout in "Char" to the end of a syllable, type a hyphen and depress "Auto." The carrier will return and the remainder of the word will be placed on the next line.

NOTE:

1. If excessive characters are played out in "Char." when making a hyphenation decision, depressing "Auto" will reset the system to the beginning of the hyphenation decision.
2. The system will not accept the hyphen if printing it would require more than the line length. Since the hyphen is 3 units, this will only occur if the carrier is less than 3 units from the line length. When this happens, depress "Auto" to return the system to the beginning of the hyphenation decision. Then break the word at an earlier syllable or reject hyphenation by depressing "Auto" a second time.
3. If a typing error is made while typing the hyphen, backspace over the error, type the hyphen, key a carrier return and depress "Auto."

COLUMN INSTRUCTION CODES

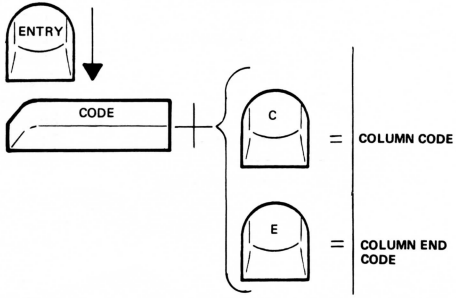
Text may be entered into memory in one long column and played back in multicolumns by using column instruction codes. These codes may be entered at the time the text is being keyboarded or after the complete text has been entered into memory.

TO ENTER COLUMN INSTRUCTION CODES:

1. System in "Entry" mode.
2. Carrier at left margin or indent level.
3. Enter a Coded "C" (column code) at the beginning point for each column. The printer will carrier return and print a "C" at the margin.

   SPECIAL RULES:
   - A. IF A NEW LINE LENGTH IS TO BE ENTERED FOR ANY COLUMN:
     - (1) A "SMALLER" column line length than the previous line length.
       - (a) Enter a format and the new line length.
       - (b) Enter a column code.
     - (2) A "LARGER" column line length than the previous line length:
       - (a) Enter a column code.
       - (b) Enter a format and the new line length.
   - B. IF YOU ARE ENTERING MORE THAN FOUR COLUMNS — All the columns after the fourth must have the same line length as the fourth column.
4. Enter a Coded "E" (column end code) at the end of the last column. The printer will carrier return and print an "E" at the margin.

NOTE: Tabs must be set for each column for final playback.

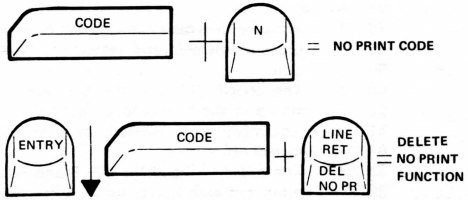


NO PRINT

Material can be produced in final form in "Entry" mode by using the no print (Coded "N"). No print is used to produce completed copy on forms, for centered or flush right headings in statistical jobs and for exact alignment in tabular and special format jobs. When no print is entered, the carrier moves over three (3) picas which positions the long, red vertical line on the cardholder at the typing position. The condition light will be on solid until the no print sequence has been completed or deleted. The no print "area," in which the text is to be typed, must always be indicated. This no print "area" can begin and end at any point within the line length. The "begin" point is the point at which the no print code is entered and the "end" point is the point at which a carrier return is keyed.

No Print Operation:

1. Key a no print code at the "begin" point — The carrier moves over 3 picas and the condition light is on solid. The long, red vertical line on the cardholder indicates the "begin" point.
2. Position the carrier and enter the no print material— The carrier escapes normally without printing.
3. Tab or space to the "end" point and key a carrier return. (If the carrier return is keyed immediately after the no print material, it will print "Flush Left" at the "begin" point.)



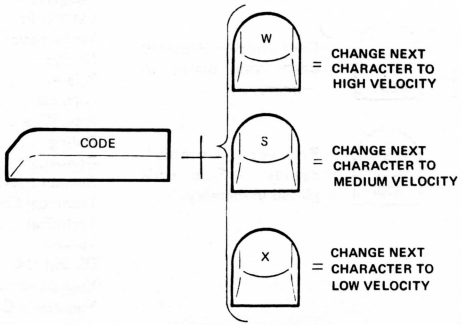
—The carrier will backspace to the "begin" point and print the no print text as formatted. The condition light is turned off to indicate that the no print sequence has completed.

NOTE:

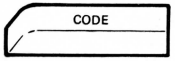
1. If a typing error is made in no print, backspace to correct the error or key a delete no print (Coded "Line Return"). Delete no print returns the carrier to the point at which the no print code was entered and deletes the no print code and material from memory.
2. "No Print" is active in both "Entry" and "Final" modes, except that nothing is entered in memory in "Final" mode.

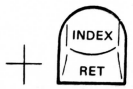
MANUAL VELOCITY CONTROL

The velocity of any character can be changed, for one print operation only, by keying a coded "w," "s," or "x." The coded velocity instructions are not stored in memory and there is no printer reaction when keying them.

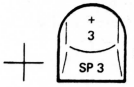


ADDITIONAL CODES

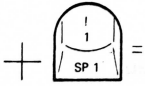




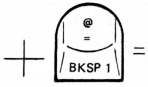
= Printer carrier returns without indexing. Zero index c/ret code placed in memory in "Entry" mode.



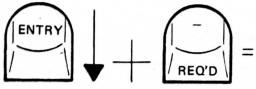
= Printer spaces 3 units — Required space 3 code placed in memory in "Entry" mode.



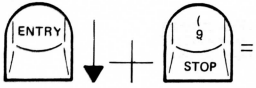
= Printer spaces 1 unit — Required space 1 code placed in memory in "Entry" mode.



= Printer backspaces 1 unit — Backspace 1 code placed in memory in "Entry" mode.



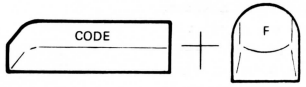
= Dash prints — Required dash code placed in memory.



= Printer "Dummy" cycles — Stop code placed in memory.

FONT SELECTION

When the power button is turned on, the electronics automatically set the proper escapement and velocity values for the "Home Country" font selection. Keying a Coded "F," followed by the selected two-digit font identification number, will automatically set escapement and velocity values for that font group and can be entered at any time.



+ TWO DIGIT FONT
I.D. NUMBER = FONT SELECTION

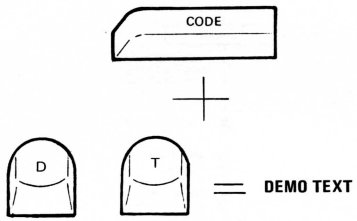
FONT IDENTIFICATION NUMBERS

ABA	84
Bold-Light A-C	45
Brazil	61
Copperplate Gothic	79
Copperplate Gothic DC	68
CG Fraction	72
France	33
Germanic	43
Greek Symbol	56
Hungarian	53
Latin & French Latin	41
Mathematics	46
Nordic	50
Poland	49
Portugal	63
Press Wire	57
Ruling	76
Romanian	55
Russian (Cyrillic or Latin)	80
Technical Composition	60
Technical	62
Turkey	51
US and UK	64
Yugoslavia	37
Yugoslavia Cyrillic	39

NOTE:

1. All other two-digit numbers will be accepted, but will cause escapement and velocity to be a casual selection.
2. The coded "F" and the two following digits are stored in the instructions memory until a new font identification is entered, or until the machine is turned off.
3. The coded "F" and the two following digits will not print, but each will cause a printer "Dummy" cycle.

DEMO TEXT



NEW CAPABILITIES IN DIRECT IMPRESSION COMPOSITION

Now copy can be justified without typing the text two times! Errors are easily corrected by backspacing and typing over. Copy can be produced in a variety of formats with calculations done automatically.

PRODUCT FEATURES

. . . . . Format flexibility . . . . . .
. . . . . .Electronic memory . . . . . .
. . . . . Multilingual capability . . . . . .
. . . . . Special font utilization . . . . . .
. . . . . .Expanded ribbon supply . . . . . .
. . . . . .Improved service diagnostics . . . . . .

MACHINE OPERATING INSTRUCTIONS

CONDITION LIGHT:



ON
SOLID

1. Printer in "No Print" Condition — Carrier displaced 3 picas to right of actual typing position.
2. On 15 seconds for "Demo Alignment" retrieval.
3. On 30 seconds for "Demo Text" retrieval.



BLINKING
RAPIDLY

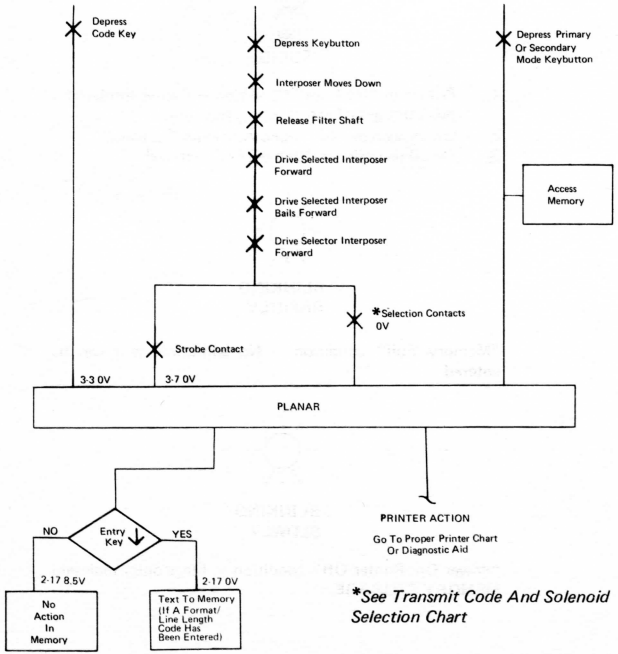
"Memory Full" condition — No additional text can be entered.



BLINKING
SLOWLY

"Power On, Printer Off" condition — Electronics maintain MEMORY STORAGE.

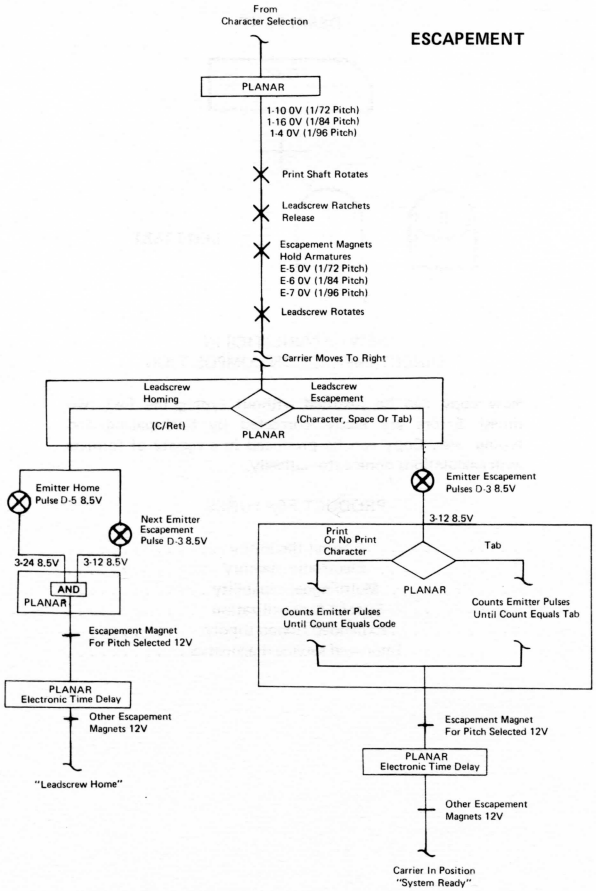
KEYBOARD



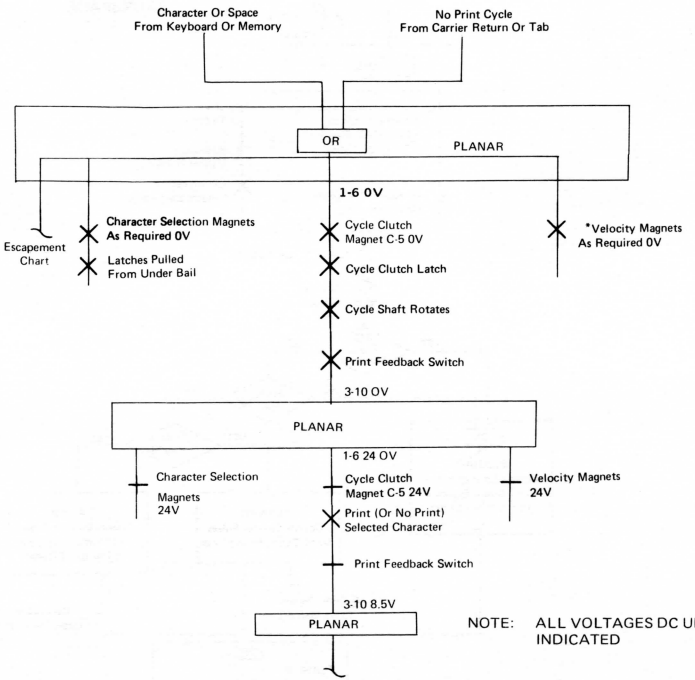
See Transmit Code And Solenoid Selection Chart

NOTE: ALL VOLTAGES DC UNLESS INDICATED

ESCAPEMENT



CHARACTER SELECTION

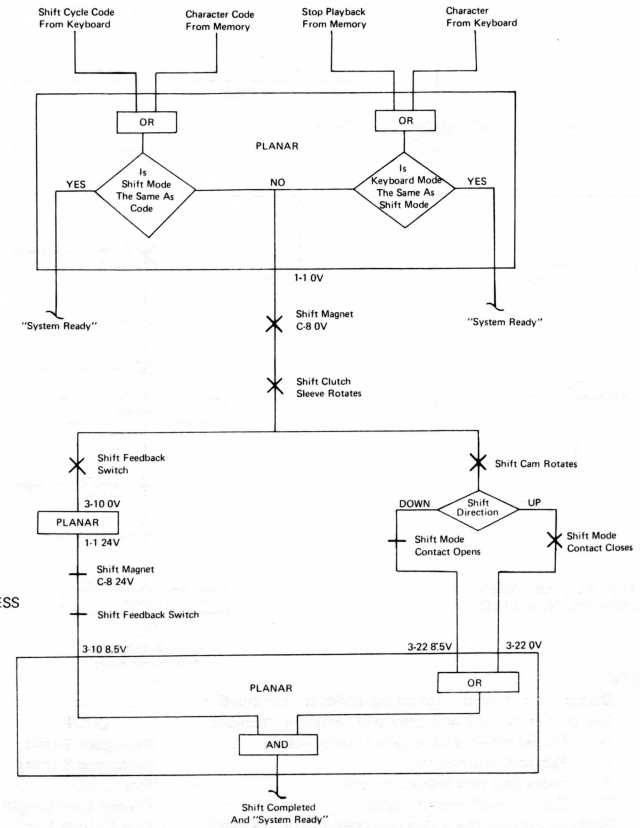


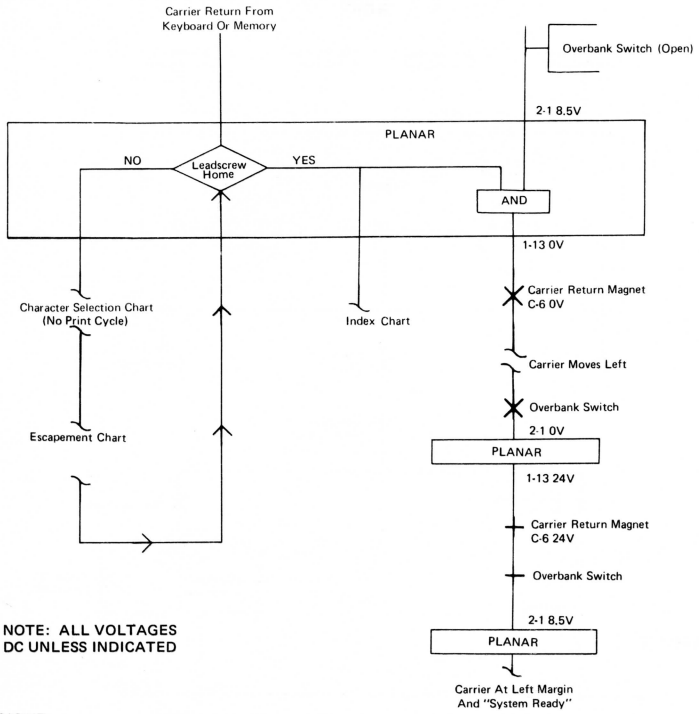
NOTE: ALL VOLTAGES DC UNLESS INDICATED

*VELOCITY SELECTION

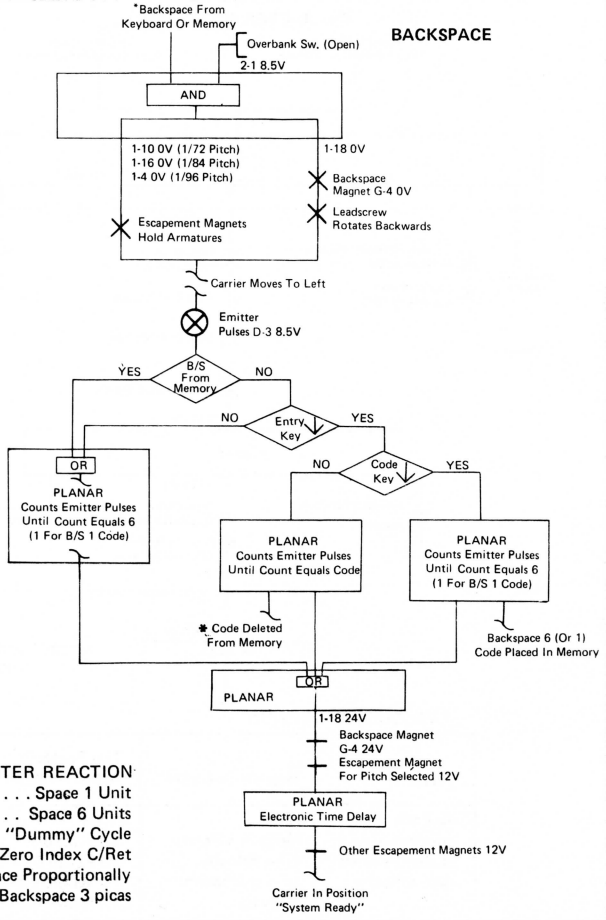
Character	Magnets Operated	Test Points & Active Voltages
No Print	None	None
Low Velocity	Medium Velocity	1-7 (G2) 0V
Medium Velocity	Low Velocity	1-11 (G3) 0V
High Velocity	Low & Medium Velocity	1-7 (G2) 0V & 1-11 (G3) 0V

SHIFT





NOTE: ALL VOLTAGES DC UNLESS INDICATED

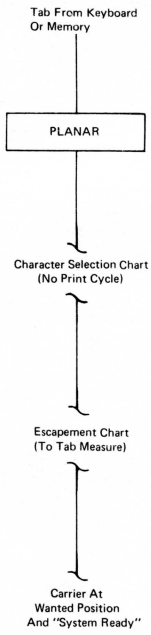


*NOTE:

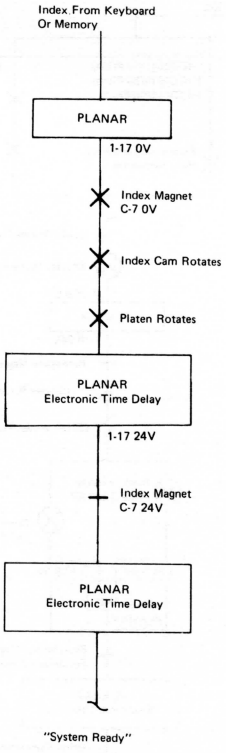
1. Backspacing over the following codes is "Inhibited" (no printer action) and they will remain in memory
   - A. Carrier return and required carrier return
   - B. Tab and required tab
   - C. Index and zero index c/return
   - D. Column malfunction codes
2. Backspacing over the following codes will delete them from memory and give the following printer reaction.

CODE	PRINTER REACTION
Backspace 1 Unit	Space 1 Unit
Backspace 6 Units	Space 6 Units
Stop	"Dummy" Cycle
Format Line Length	Zero Index C/Ret
Line Format Instr.	Backspace Proportionally
No Print	Backspace 3 picas

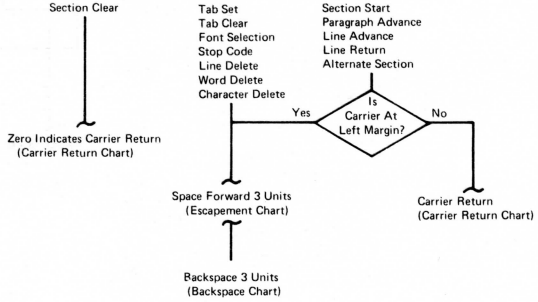
TAB



INDEX

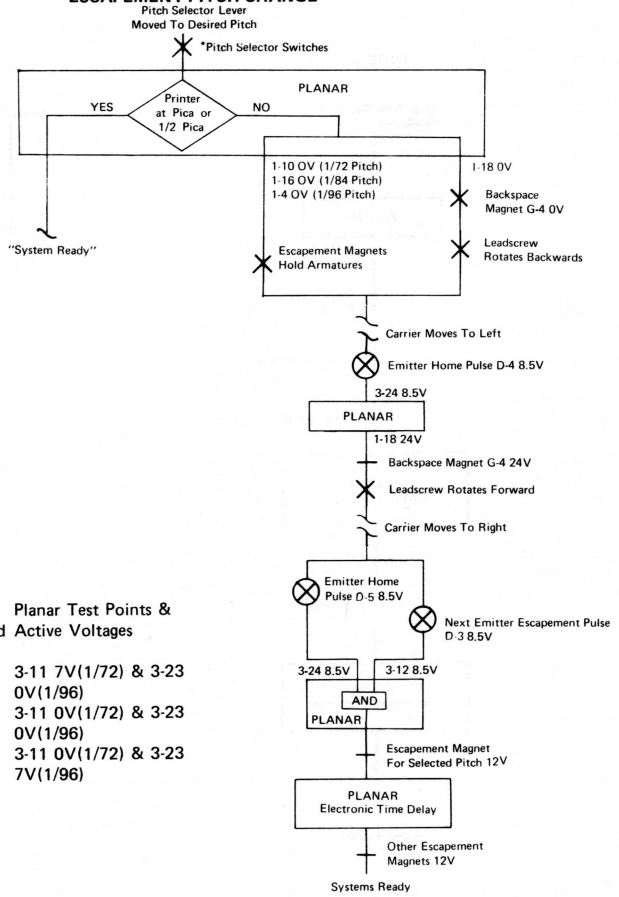


DUMMY CYCLE



NOTE: ALL VOLTAGES
DC UNLESS INDICATED

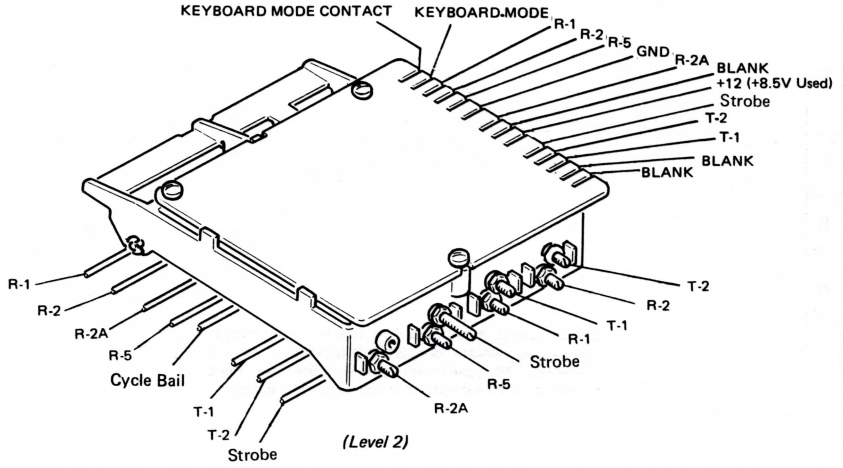
ESCAPEMENT PITCH CHANGE



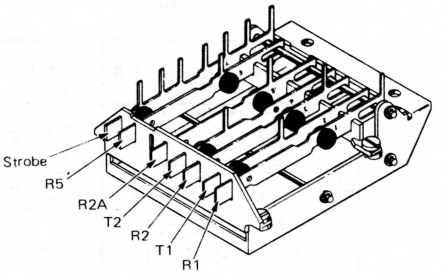
*PITCH SELECTION LOGIC

Pitch	Platen Switches Operated	Planar Test Points & Active Voltages
1/72	None	3-11 7V(1/72) & 3-23 0V(1/96)
1/84	Outboard (1/72)	3-11 0V(1/72) & 3-23 0V(1/96)
1/96	Outboard (1/72) & Inboard (1/96)	3-11 0V(1/72) & 3-23 7V(1/96)

NOTE: ALL VOLTAGES DC UNLESS INDICATED



(Level 2)



(Level 1)

Reed Switches And Magnet/Solenoids Operated

	R1 R2 R2A R5	– R2 R2A R5	R1 – R2A R5	– – R2A R5	R1 – – R5	R1 R2 R2A –	– R2 R2A –	R1 – R2A –	– – R2A –	R1 – – –	– – – –	
T1 T2	[ ]	# 3	& 7	* 8	$ 4	Z	@ 2	% 5	¢ 6	) 0	(9	T-0
– T2	X	U	D	C	L	T	N	E	K	H	B	T-1
T1 –	M	V	R	A	O	° !	.	" '	I	S	W	T-2
– –	G	F	: ;	'	? /	J	+ =	P	Q	Y	— –	T-3
	-5	-4	-3	-2	-1	Home	+1	+2	+3	+4	+5	

Typehead Selection

Functions:

Space T1, T2, R5
Tab T2, R2, R5
Carrier Return T2, R1, R2, R5
Backspace R2, R5
Index R1, R2, R5
UC Shift T2, R5
LC Shift R5

*Note: Solenoid Selection For Tab is T1, R2 and R5.

MC II Solenoid Selection, Space And Tab ..... T1, T2, R1, R2, &R2A

E/MC

A

	-5	-4	-3	-2	-1	HOME	+1	+2	+3	+4	+5
UPPER CASE T-0	M ! 6	H # 6	H & 6	M * 6	H $ 6	H Z 7	H @ 6	H % 6	M ¢ 6	M) 6	M (6
UPPER CASE T-1	H X 8	H U 8	H D 8	H C 8	H L 7	H T 8	H N 8	H E 7	H K 8	H H 8	H B 8
UPPER CASE T-2	H M 9	H V 8	H R 8	H A 8	H O 8	H ¼ 6	L . 6	M " 6	M I 4	H S 7	H W 9
UPPER CASE T-3	H G 8	H F 7	L : 6	L , 6	M ? 6	M J 6	M + 6	H P 7	H Q 8	H Y 8	L _ 6

Charts, A & B, may be used to determine the escapement value, velocity, & rotate/tilt location of a given character. The escapement value is in the lower right corner, and the velocity is in the upper left corner.

B

	-5	-4	-3	-2	-1	HOME	+1	+2	+3	+4	+5
LOWER CASE T-0	M] 6	H 3 6	M 7 6	H 8 6	H 4 6	M z 6	H 2 6	H 5 6	H 6 6	H 0 6	H 9 6
LOWER CASE T-1	M x 7	H u 7	H d 7	M c 6	M l 4	M t 4	H n 7	M e 6	H k 7	H h 7	H b 7
LOWER CASE T-2	H m 9	M v 7	M r 6	M a 6	M o 6	M ½ 6	L . 6	L ' 4	M i 4	M s 6	H w 9
LOWER CASE T-3	H g 7	M f 4	L ; 6	L , 6	M / 6	M j 4	M = 6	H p 7	H q 7	H y 7	L - 6

NOTE: L — Low Velocity

M — Medium Velocity

H — High Velocity

All WT 88 Character Keyboards

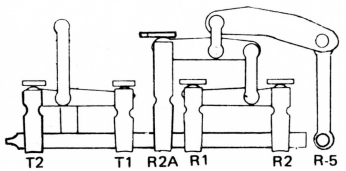
Keyboard No.....

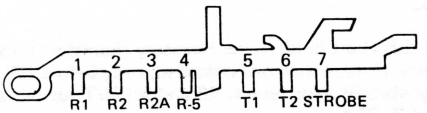
Reed Switches Active														
	R1	—	—	R1	—	R1	—	R1	R1	—	R1	—	R1	—
	R2	R2	—	R2	R2	—	—	—	R2	R2	—	—	—	—
	—	—	—	R2A	R2A	R2A	R2A	—	R2A	R2A	R2A	R2A	—	—
	R5	R5	R5	R5	R5	R5	R5	R5	—	—	—	—	—	—

NOTE:

1. Use this chart to fill in the necessary characters for the keyboard of your choice. If more than one is needed, copy before filling in characters.
2. Magnets on MC 72 for space are T1, T2 and R5.
3. Magnets on E/MC 72 for space and tab are T1, T2 and R5.
4. Magnets/Solenoids on MC 82 and MEM/T for tab and space are T1, T2, R1, R2 and R2A.
5. Magnets/Solenoids on Electronic Composer for space and tab are T1, T2 and R5.

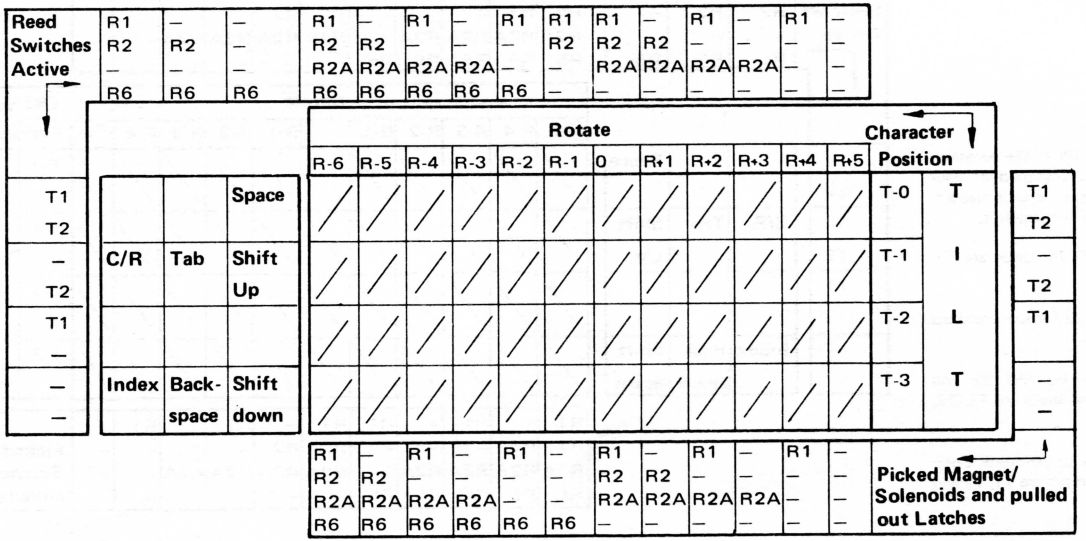
				Rotate										Character Position		
				R-5	R-4	R-3	R-2	R-1		R+1	R+2	R+3	R+4	R+5			
T1 T2			Space												T-0	T	T1 T2
— T2		C/R	Tab	Shift Up											T-1	I	— T2
T1 —															T-2	L	T1 —
— —		Index	Back-space	Shift down											T-3	T	— —
R1 R2 R2A R5	— — — —	R1 R2 R2A R5	— — — —	R1 — — R5	R2 R2A —	— R2A R5	R2 R2A —	R2 R2A R5	— — —	R2 R2A —	— R2A —	— R2A —	— — —	— — —	Picked Magnet/ Solenoids and pulled out Latches		





All WT 96 Character Keyboards — Old Arrangement —

Keyboard No.....

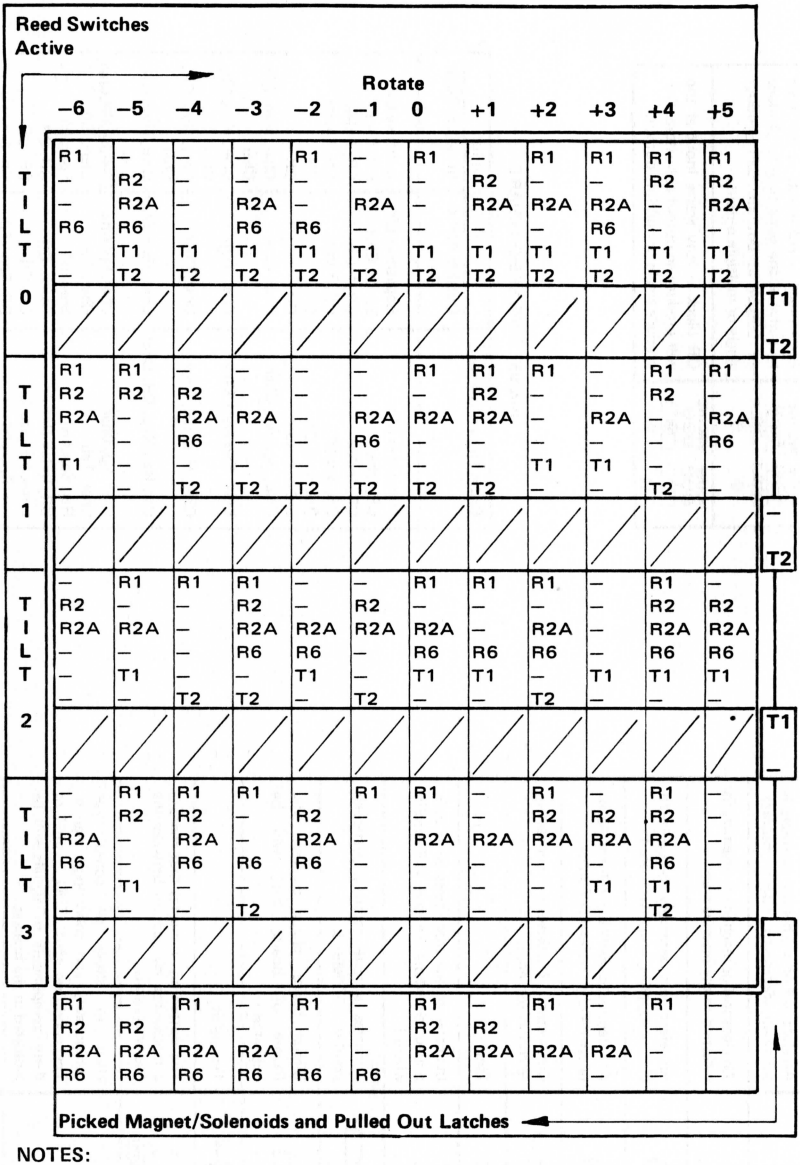


NOTES:

1. Use this chart to fill in the necessary characters for the keyboard of your choice. If more than one is needed, copy before filling in characters.
2. Magnets/Solenoids on MC 96 and MEM/T for tab and space are T1, T2, R1, R2, R2A.

All WT 96 Character Keyboard — New Arrangement —

Keyboard No.....

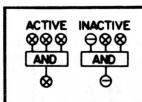
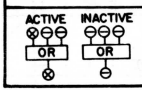


NOTES:

1. Use this chart to fill in the necessary characters for the keyboard of your choice. If more than one is needed, copy before filling in characters.
2. Magnets/Solenoids on MC 96 and MEM/T for tab and space are T1, T2, R1, R2, R2A.
3. Reed Switches for functions see 88 Character or 96 Character — Old Arrangement — chart.

FUNCTION CHART SYMBOLS

	An electrical or mechanical assembly is activated (Solenoids, relays, motors).
	An electrical or mechanical assembly is returned to the inactive state.
	An electronic assembly is operated (Power supplies, transistors, etc.).
	An electronic assembly returns to its unoperated or normal condition.
	Connector (Accessory connector, M-connector, etc.).
	Time delay.
	Indicates a line that starts or is continued, elsewhere. (A note will specify where.)
	Indicates a note about a particular point or component.
	Circuit board, planar package, etc. (Name of board, etc., will be indicated.)
	Test point.
	The dotted line indicates that there is a mechanical connection between the two operations.
	Used to show all contact-type components and solid logic signals. The condition (N/C, N/O. . .etc.) of these components or signals will be indicated in the bracket.
	Decision block.

	AND block — All inputs at top must be active at the same time to produce an output at bottom. Can produce single or multiple output.
	OR block — Any active input at top will produce an output at bottom. Can produce single or multiple output.

ADJUST CONVERSION CHART

Codes Read From Card	Printer Action	
	Outside Adjust Zone	In Adjust Zone
Successive CRs	Repetitive CRs	Repetive CRs
CR, Char	Space, Char	CR, Char
CR, Index	CR, Index	CR, Index
CR, Tab(s)	CR, Tab(s)	CR, Tab(s)
Required CR	CR	CR
Index Return	CR	CR
Char, Hyphen, Char	Char, Char	Char, Hyp, CR, Char
Char, Req Hyp, Char	Char, Hyp, Char	Char, Hyp, CR, Char
Char, Hyp, CR, Char	Char, Char	Char, Hyp, CR, Char
Car, Req Hyp, CR, Char	Char, Hyp, Char	Char, Hyp, CR, Char
Char, Sp, Char	Char, Sp, Char	Char,Sp,CR,Char
Char, Tab	Char, Tab	Char, Tab
Req Space(s)	Space(s)	Space(s)
CR, Index Return	Space, CR	CR, CR
Index Return, CR	CR, CR	CR, CR
CR, Space(s)	CR, Space(s)	CR, Space(s)
Space, CR	Space	Space, CR
CR, Req Space	Space, Space	Space, Space

The following information is printed to help the Customer Engineer develop an inspection procedure for a particular machine. Those areas shown below should not be the only areas to which the CE pays attention. Since each machine installation will differ slightly in application and environment, this procedure is to be used only as a guide.

EVERY CYCLE – MC

A. Note operator's comments.
B. Perform a functional test using the CE Test Card.
C. Clean the following points with IBM Cleaning Fluid:
   1. Platen
   2. Deflector
   3. Feed Rolls
   4. Bail Rolls
   5. Cardholder (use No. 10 Oil)
   6. Type Elements. Relube lever pivot points and inside surface with No. 23 grease or silicone lubricant.

CYCLE A – MC

A. Check the rotate and tilt homing adjustments.
B. Check the carrier and alignment adjustments.
C. Lubricate the following points in the printer.

NO. 10 OIL (BOTTOM OF MACHINE)
1. Velocity tape arm (wick)
2. Velocity control linkage (wicks)
3. Velocity cam follower roller
4. Selection cam follower roller
5. Rotate link pivots
6. Selection bail pivots (wicks)
7. Positive latch bail pivots
8. Positive latch bail roller pivots
9. Negative latch bail pivots
10. Negative latch bail roller pivots
11. Filter shaft clutch check latch (wick)
12. Shift arm pivot (wick)
13. Filter shaft bearings

NO. 23 GREASE (BOTTOM OF MACHINE)
1. Camming surface of shift down keylever latch
2. Shift down keylever latching surface
3. Contact point between selection armatures and interposers
4. Velocity yoke shaft
5. Filter shaft operating surface

CYCLE B – MC

A. Clean the following parts in the console with the Alcohol Pad:
   1. Card drive actuator rollers
   2. Head pad
   3. Magnetic head
   4. Clean all drive rollers
   5. Check belts – replace or clean with IBM Cleaning Fluid
B. Lubricate the following points in the card deck.

NO. 10 OIL
1. All idler arm pivot points
2. All idler roller pulley studs
3. Motor
4. Slip clutch wick
5. Head carriage guide shaft (light smear)

NO. 23 GREASE
1. Actuator roller magnet armature pivot point
2. Stop latch contact points
3. Idler roller mounting studs – (light film)

CYCLE C – MC

A. Check the impression and velocity adjustments.
B. Lubricate the following points in the printer.

NO. 10 OIL (TOP OF MACHINE)
1. Rotate, tilt and velocity pulleys
2. Idler gear bearings
3. LH cycle shaft bearing
4. Tilt arm pivot
5. Rotate arm pivot (wick)
6. Cord pulley bearings
7. Motor
8. Print shaft bearings
9. All selection latches and differential lever pivots
10. Rotate bellcrank
11. Tab solenoid arm (wick)
12. Top of rotate bellcrank (wick)
13. Center bearing
14. Operational shaft support
15. B/S cam (wick)
16. B/S cam follower pivot
17. B/S intermediate lever (wick)
18. B/S bellcrank (wick)
19. Index cam (wick)
20. Index cam follower pivot (wick)
21. Escapement cam follower pivot (wick)
22. Escapement arm (wick)
23. Shift arm pulley
24. Shift cam back up roller
25. Shift arm roller
26. Print shaft wipers
27. Ribbon lift bail (wicks)
28. Print cam follower pivot
29. Escapement pawl
30. Tilt ring pivot pins
31. Upper ball sockets
32. Tilt bellcrank and link
33. Rocker shaft

CYCLE D – MC

A. Power clean the printer and wash the machine covers.
B. Lubricate the following points in the printer.

NO. 23 GREASE (TOP OF MACHINE)
1. Idler gear teeth
2. Shift down keylever driver contact point
3. Cycle clutch restore cam
4. Cycle clutch (keep excess lube off magnet armature)
5. Escapement rack
6. Front carrier support
7. Torque bar surfaces
8. Clutch ratchets
9. B/S rack at the drive point
10. Paper release lever cam surface
11. Op. shaft bearing and shift clutch spring
12. Ribbon lift cam
13. Detent cam

EVERY CYCLE – E/MC

A. Note operator's comments.
B. Perform a functional test using the CE Test Card.
C. Clean the following points with IBM Cleaning Fluid:
   1. Platen
   2. Deflector
   3. Feed Rolls
   4. Bail Rolls
   5. Cardholder (use No. 10 Oil)
   6. Type Elements. Relube lever pivot points and inside surface with No. 23 grease or silicone lubricant.

CYCLE A – E/MC

A. Check the rotate and tilt homing adjustments.
B. Check the carrier and alignment adjustments.
C. Check tab bracket eccentric adjustment.
D. Lubricate the following points in the printer.

NO. 10 OIL (BOTTOM OF MACHINE)
1. Cycle shaft bearings
2. Velocity cam follower roller
3. Selection cam follower roller and link pivots (wick)
4. Rotate latch points
5. Selection bail pivots (wicks)
6. Positive latch bail pivots
7. Positive latch bail roller pivots
8. Negative latch bail pivots
9. Negative latch bail roller pivots
10. Filter shaft clutch check latch (wick)
11. Shift arm pivot (wick)
12. Filter shaft bearings

NO. 23 GREASE (BOTTOM OF MACHINE)
1. Camming surface of shift down keylever latch
2. Shift down keylever latching surface
3. Contact point between selection armatures and interposers
4. Velocity yoke shaft
5. Filter shaft operating surface
6. Velocity cam surface
7. Tab wheel gear

CYCLE B – E/MC

A. Clean the following parts in the console with the Alcohol Pad:
   1. Card drive actuator rollers
   2. Head pad
   3. Magnetic head
   4. Clean all drive rollers
   5. Check belts – replace or clean with IBM Cleaning Fluid.

B. Lubricate the following points in the card deck.

NO. 10 OIL
1. All idler arm pivot points
2. All idler roller pulley studs
3. Motor
4. Slip clutch wick
5. Head carriage guide shaft (light smear)

NO. 23 GREASE
1. Actuator roller magnet armature pivot point
2. Stop latch contact points
3. Idler roller mounting studs – (light film)

CYCLE C – E/MC

A. Check the impression and velocity adjustments.
B. Check tab adjustments.
C. Lubricate the following points in the printer.

NO. 10 OIL (TOP OF MACHINE)
1. Rotate, tilt and velocity pulleys
2. Idler gear bearings
3. Tilt arm pivot
4. Rotate arm pivot (wick)
5. Cord pulley bearings
6. Motor
7. Belt idler roller
8. Print shaft bearings
9. All selection latches and differential lever points
10. Rotate bellcrank
11. Top of rotate bellcrank (wick)
12. Tab wheel bearing
13. Escapement clutch (3 drops) (wick)
14. Leadscrew drive shafts
15. Index cam (wick)
16. Index cam follower pivot (wick)
17. Escapement cam follower pivot (wick)
18. Escapement knockoff arm (wick)
19. Escapement clevis pins
20. Shift arm pulley
21. Shift cam backup roller
22. Shift arm roller
23. Print shaft wipers
24. Leadscrew center support
25. Ribbon lift guide slots (1 drop)
26. Ribbon lift arm pivots
27. Ribbon lift cam follower roller and pivot
28. Ribbon feed roller
29. Ribbon spike driver pivot
30. Print cam follower pivot
31. Escapement shoe
32. Tilt ring pins
33. Upper ball socket
34. Tilt bellcrank and link
35. Rocker bearings

CYCLE D – E/MC

A. Power clean the printer and wash the machine covers.
B. Lubricate the following points in the printer.

NO. 23 GREASE (TOP OF MACHINE)
1. Idler gear teeth
2. Shift down keylever drive contact point
3. Cycle clutch restore cam
4. Cycle clutch (keep excess grease off magnet armature)
5. Rear rail
6. Leadscrew
7. Front carrier support
8. Clutch ratchets
9. Paper release lever cam surface
10. Op. shaft bearings and shift clutch spring
11. Ribbon lift cam
12. Detent cam
13. Print cams
14. Rocker restore cam
15. Center bearing

EVERY CYCLE – MC II, MC/A

A. Note operator's comments.
B. Perform a function test using the CE Test Card.
C. Clean cardholder with No. 10 oil.
D. Clean the following points with IBM Cleaning Fluid:
   1. Platen
   2. Deflector
   3. Feed Rolls
   4. Bail Rolls
   5. Type elements. Relube lever pivot points and inside surface with No. 23 grease or silicone lubricant.

CYCLE A – MC II, MC/A

A. Check the rotate and tilt homing adjustments.
B. Check the carrier and alignment adjustments.
C. Lubricate the following points in the printer:

NO. 10 OIL (BOTTOM OF MACHINE)
1. Selection cam follower roller
2. Rotate link pivots
3. Selection bail pivots (wick)
4. Positive latch bail pivots
5. Positive latch bail roller pivots
6. Negative latch bail pivots
7. Negative latch bail roller pivots
8. FSC check latch (wick)
9. Shift arm pivot (wick)
10. Filter shaft bearings
11. Cycle shaft gear plate bearing

NO. 23 GREASE (BOTTOM OF MACHINE)
1. Camming surface of shift down keylever latch
2. Shift down keylever latching surface
3. Contact point between selection armatures and interposers
4. Velocity yoke slider

CYCLE B – MC II, MC/A

A. Clean the following parts in the console with the Alcohol Pad:
   1. Head carriage guide shaft
   2. Card drive actuator rollers
   3. Head pad
   4. Magnetic head
   5. All drive rollers and pulleys
   6. Check belts—clean or replace
   7. Track 1 return drive strip (use clean paper towel; cloth towels may contain contamination).

B. Lubricate the following points in the card deck:

NO. 10 OIL
1. Motor
2. Head carriage guide shaft (light smear)

NO. 23 GREASE
1. Actuator roller magnet armature pivot point
2. Escapement rack teeth and bias surfaces
3. All idler roller pulley studs
4. Pressure roller pivot stud
5. Check pawl adjusting screw/pawl contact point
6. Track step pawl adjusting screw/check pawl contact point
*7. Pack feed inhibitor and inhibitor armature contact point
*8. Pack feed pivot plate pivots
9. Track 1 entry guide
10. Idler roller mounting studs – (light film)

* (MC II only)

CYCLE C – MC II, MC/A

A. Check the impression and velocity adjustments.
B. Lubricate the following points in the printer:

NO. 10 OIL (TOP OF MACHINE)
1. Rotate and tilt pulleys
2. Idler gear bearings
3. LH cycle shaft bearing
4. Tilt arm pivot
5. Rotate arm pivot (wick)
6. Card pulley bearings
7. Motor
8. Print shaft bearings
9. All selection latches and differential lever pivots
10. Rotate bellcrank
11. Top of rotate bellcrank (wick)
12. Center bearing
13. Index cam (wick)
14. Index cam follower pivot (wick)
15. Escapement cam follower pivot (wick)
16. Shift arm pulley
17. Shift cam backup roller
18. Shift arm roller
19. Print shaft wipers
20. Print cam follower pivot
21. Tilt ring pivot pins
22. Upper ball sockets
23. Tilt bellcrank and link
24. Rocker shaft
25. Motor belt idler roller
26. Escapement clutch (3 drops) (wick)
27. Leadscrew drive shafts
28. Escapement knockoff arm (wick)
29. Leadscrew center support

CYCLE D – MC II, MC/A

A. Power clean the printer and wash the machine covers.
B. Lubricate the following points in the printer:

NO. 23 GREASE (TOP OF MACHINE)
1. Idler gear teeth
2. Shift down keylever driver contact point
3. Cycle clutch restore cam
4. Cycle clutch (keep excess lube off magnet armature
5. Front carrier support
6. Clutch ratchets
7. Paper release lever cam surface
8. Op. shaft bearing and shift clutch spring
9. Ribbon lift cam
10. Detent cam
11. Rear rail
12. Leadscrew
13. Print cams
14. Ribbon feed cam
15. Ribbon cam windows and surface
16. Correcting torque bar backup support
17. Correcting feed cam follower sliding surfaces
18. Correcting lift cam follower surfaces
19. Correcting feed pawl sliding surfaces

NO. 10 OIL
1. Ribbon lift guide slots (1 drop)
2. Ribbon lift arm pivots
3. Ribbon lift cam follower roller and pivot
4. Ribbon feed roller
5. Ribbon spike driver pivot
6. Correcting lift actuator pivot
7. Correcting feed inhibitor pivot

EVERY CYCLE — MEM/T

A. Note operator's comments.
B. Perform a complete functional check.
C. Clean cardholder with No. 10 oil.
D. Clean the following points:
IBM CLEANING FLUID
1. Platen
2. Deflector
3. Feed Rolls
4. Bail Rolls
5. Type Elements. Lubricate pivot points and inside surface with No. 23 grease or silicone lubricant.

CYCLE A — MEM/T

A. Check the rotate and tilt homing adjustments.
B. Check the carrier and alignment adjustments.
C. Lubricate the following points in the printer:
NO. 10 OIL (BOTTOM OF MACHINE)
1. Selection cam follower roller
2. Rotate link pivots
3. Selection bail pivots (wicks)
4. Positive latch bail pivots (wicks)
5. Positive latch bail roller pivots
6. Negative latch bail pivots
7. Negative latch bail roller pivot
8. Filter shaft clutch check latch (wick)
9. Shift arm pivot (wick)
10. Filter shaft bearings
11. Cycle shaft gear plate bearing

NO. 23 GREASE (BOTTOM OF MACHINE)
1. Camming surface of shift down keylever latch
2. Shift down keylever latching surface
3. Contact point between selection armatures and interposers
4. Velocity yoke slider
5. Filter shaft operating surface

CYCLE B — MEM/T

A. Check the tape loop adjustments.
NOTE: DO NOT LUBRICATE

CYCLE C — MEM/T

A. Check the impression and velocity adjustments.
B. Lubricate the following points in the printer:
NO. 10 OIL (TOP OF MACHINE)
1. Rotate and tilt pulleys
2. Idler gear bearings
3. Left cycle shaft bearing
4. Tilt arm pivot
5. Rotate arm pivot (wick)
6. Motor
7. Print shaft bearings
8. All selection latches and differential lever pivots
9. Rotate bellcrank
10. Top of rotate bellcrank (wick)
11. Center bearing
12. Index cam (wick)
13. Index cam follower pivot (wick)
14. Escapement cam follower pivot (wick)
15. Shift arm pulley
16. Shift cam backup roller
17. Shift arm roller
18. Print shaft wipers
19. Print cam follower pivot
20. Tilt ring pivot pins
21. Upper ball sockets
22. Tilt bellcrank and link
23. Rocker shaft
24. Motor belt idler roller
25. Escapement clutch (3 drops) (wick)
26. Leadscrew drive shafts
27. Escapement knockoff arm (wick)
28. Leadscrew center support

CYCLE D — MEM/T

A. Power clean the printer and wash the machine covers.
NOTE: Cover tape loop area with a cloth before power cleaning.
B. Lubricate the following points in the printer:
NO. 23 GREASE (TOP OF MACHINE)
1. Idler gear teeth
2. Shift down keylever driver contact point
3. Cycle clutch restore cam
4. Cycle clutch (keep excess lube off magnet armature)
5. Front carrier support
6. Clutch ratchets
7. Paper release lever cam surface
8. Op. shaft bearing and shift clutch spring
9. Ribbon lift cam
10. Detent cam
11. Rear rail
12. Leadscrew
13. Print cams
14. Ribbon feed cam
15. Ribbon cam windows and surface
16. Correcting torque bar backup support
17. Correcting feed cam follower sliding surfaces
18. Correcting lift cam follower surfaces
19. Correcting feed pawl sliding surfaces

NO. 10 OIL
1. Ribbon lift guide slots (1 drop)
2. Ribbon lift arm pivots
3. Ribbon lift cam follower roller and pivot
4. Ribbon feed roller
5. Ribbon spike driver pivot
6. Correcting lift actuator pivot
7. Correcting feed inhibitor pivot

EVERY CYCLE — MCC

A. Note operator's comments.
B. Perform a complete functional check.
C. Perform a print quality and alignment check using diagnostic card 01 AE CE 03 and the stepped gauge font.
D. Clean the cardholder with No. 10 oil.
E. Clean the following points with IBM Cleaning Fluid:
1. Platen
2. Deflector
3. Feed Rolls
4. Fonts. Relube lever pivot points and inside surface with No. 23 grease or silicone lubricant.

CYCLE A — MCC

A. Check the rotate and tilt homing adjustments.
B. Lubricate the following points:
NO. 10 OIL (BOTTOM OF MACHINE)
1. Rotate link pivots
2. Selection bail pivots (wicks)
3. Positive latch bail pivots (wicks)
4. Positive latch bail roller pivots
5. Negative latch bail pivots
6. Negative latch bail roller pivot

7. Filter shaft clutch check latch (wick)
8. Shift arm pivot (wick)
9. Filter shaft bearings
10. Cycle shaft gear plate bearing

NO. 23 GREASE (BOTTOM OF MACHINE)

1. Camming surface of shift down keylever latch
2. Shift down keylever latching surface
3. Velocity yoke shaft
4. Filter shaft check ratchet
5. Filter shaft operating surface

CYCLE B – MCC

A. Check the following print adjustments:
1. Rotate and tilt detents
2. Upper ball socket
3. Tilt ring pivot pins
4. Font skirt clearance

B. Lubricate the following points:

NO. 10 OIL (CARRIER ASSEMBLY)

1. Print shaft wiper
2. Detent cam follower pivot
3. Print cam follower pivot
4. Carrier clamp cam follower pivot
5. Rocker bearings
6. Tilt bellcrank and link
7. Tilt detent
8. Upper ball sockets
9. Tilt ring pivot pins
10. Rotate detent guides
11. Ribbon lift guide slots (1 drop)
12. Ribbon lift arm pivots
13. Ribbon lift cam follower roller and pivot
14. Ribbon feed roller
15. Ribbon spiked driver pivot

C. Clean the following parts in the console with the Alcohol Pad:
1. Head carriage guide shaft
2. Card drive actuator rollers
3. Head pad
4. Magnetic head
5. All drive rollers and pulleys
6. Check belts–clean or replace
7. Track 1 return drive strip (use clean paper towel; cloth towels may contain contamination)

D. Lubricate the following points in the card deck:

NO. 10 OIL

1. Motor
2. Head carriage guide shaft (light smear)

NO. 23 GREASE

1. Actuator roller magnet armature pivot point
2. Escapement rack teeth and bias surfaces
3. All idler roller pulley studs
4. Pressure roller pivot stud
5. Check pawl adjusting screw/pawl contact point
6. Track step pawl adjusting screw/check pawl contact point
7. Pack feed inhibitor and inhibitor armature contact point
8. Pack feed pivot plate pivots
9. Track 1 entry guide
10. Idler roller mounting studs–(light film)

CYCLE C – MCC

Lubricate the following points:

NO. 10 OIL

1. Rotate, tilt and velocity pulleys
2. Cord pulley bearings
3. Print shaft bearings
4. Idler gear bearings
5. Left cycle shaft bearing
6. Cycle shaft check ratchet
7. Velocity tape arm pivot
8. Velocity cam follower roller pivot
9. Tilt arm pivot
10. Rotate arm pivot (wick)
11. All selection latches and differential lever pivots
12. Rotate bellcrank
13. Top of rotate bellcrank (wick)
14. Escapement clutch (3 drops) (wick)
15. Leadscrew drive shafts
16. Motor
17. Motor belt idler roller
18. Leadscrew center support
19. Leadscrew bearings
20. Center bearing
21. Index cam (wick)
22. Index cam follower pivot (wick)
23. Escapement cam follower pivot (wick)
24. Escapement cam follower roller
25. Escapement link pivots
26. Escapement knockoff arm pivots
27. Shift arm pulley
28. Shift cam backup roller
29. Shift arm roller
30. Index pawls
31. Index pawl carrier pivot
32. Index link pivots
33. Multiplying lever pivot
34. Platen bushings
35. Print shaft shield pulleys

CYCLE D – MCC

A. Power clean the printer and wash the machine covers.

B. Lubricate the following points:

NO. 23 GREASE (TOP OF MACHINE)

1. Front carrier support rail
2. Rear rail
3. Leadscrew
4. Idler gear teeth
5. Velocity cam surface
6. Cycle shaft check ratchet
7. Cycle clutch restore cam
8. Cycle clutch (keep excess lube off magnet armature)
9. Clutch ratchets
10. Op. shaft bearing and shift clutch spring
11. Escapement cam
12. Platen ratchet teeth
13. Planetary, sun and ring gears
14. Index selector guide
15. Paper release lever cam surface
16. Carrier clamp cam
17. Rocker restore cam
18. Print cams
19. Ribbon feed cam
20. Detent cam
21. Ribbon lift cam
22. Ribbon cam windows and surface
23. Ribbon lift adjustment screw
24. Shift down keylever driver contact point
25. Escapement magnet pivot plate

EVERY CYCLE — E.S.C.

A. Note operator's comments.
B. Perform a complete functional check.
C. Perform a print quality and alignment check using the "Demo Alignment" program and the stepped gauge font.
D. Clean the cardholder with No. 10 oil.
E. Clean the following points with IBM Cleaning Fluid:
   1. Platen
   2. Deflector
   3. Feed Rolls
   4. Fonts. Relube lever pivot points and inside surface with No. 23 grease or silicone lubricant.

CYCLE A — E.S.C.

A. Check the rotate and tilt homing adjustments.
B. Lubricate the following points:
   NO. 10 OIL (BOTTOM OF MACHINE)
   1. Rotate link pivots
   2. Selection bail pivots (wicks)
   3. Positive latch bail pivots (wicks)
   4. Positive latch bail roller pivots
   5. Negative latch bail pivots (wicks)
   6. Negative latch bail roller pivot
   7. Filter shaft clutch check latch (wick)
   8. Shift arm pivot (wick)
   9. Filter shaft bearings
   10. Cycle shaft gear plate bearing

   NO. 23 GREASE (BOTTOM OF MACHINE)
   1. Camming surface of shift down keylever latch
   2. Shift down keylever latching surface
   3. Velocity yoke shaft
   4. Filter shaft check ratchet
   5. Filter shaft operating surface

CYCLE B — MCC

A. Check the following print adjustments:
   1. Rotate and tilt detents
   2. Upper ball socket
   3. Tilt ring pivot pins
   4. Font skirt clearance

B. Lubricate the following points:
   NO. 10 OIL (CARRIER ASSEMBLY)
   1. Print shaft wiper
   2. Detent cam follower pivot
   3. Print cam follower pivot
   4. Carrier clamp cam follower pivot
   5. Rocker bearings
   6. Tilt bellcrank and link
   7. Tilt detent
   8. Upper ball sockets
   9. Tilt ring pivot pins
   10. Rotate detent guides
   11. Ribbon lift guide slots (1 drop)
   12. Ribbon lift arm pivots
   13. Ribbon lift cam follower roller and pivot
   14. Ribbon feed roller
   15. Ribbon spiked driver pivot

CYCLE C — E.S.C.

Lubricate the following points:
NO. 10 OIL
1. Rotate, tilt and velocity pulleys
2. Cord pulley bearings
3. Print shaft bearings
4. Idler gear bearings
5. Left cycle shaft bearing
6. Cycle shaft check ratchet
7. Velocity tape arm pivot
8. Velocity cam follower roller pivot
9. Tilt arm pivot
10. Rotate arm pivot (wick)
11. All selection latches and differential lever pivots
12. Rotate bellcrank
13. Top of rotate bellcrank (wick)
14. Escapement clutch (3 drops) (wick)
15. Leadscrew drive shafts
16. Motor
17. Motor belt idler roller
18. Leadscrew center support
19. Leadscrew bearings
20. Center bearing
21. Index cam (wick)
22. Index cam follower pivot (wick)
23. Escapement cam follower pivot (wick)
24. Escapement cam follower roller
25. Escapement link pivots
26. Escapement knockoff arm pivots
27. Shift arm pulley
28. Shift cam backup roller
29. Shift arm roller
30. Index pawls
31. Index pawl carrier pivot
32. Index link pivots
33. Multiplying lever pivot
34. Platen bushings
35. Print shaft shield pulleys

CYCLE D — E.S.C.

A. Power clean the printer and wash the machine covers.
B. Lubricate the following points:
   NO. 23 GREASE (TOP OF MACHINE)
   1. Front carrier support rail
   2. Rear rail
   3. Leadscrew
   4. Idler gear teeth
   5. Velocity cam surface
   6. Cycle shaft check ratchet
   7. Cycle clutch restore cam
   8. Cycle clutch (keep excess lube off magnet armature)
   9. Clutch ratchets
   10. Op. shaft bearing and shift clutch spring
   11. Escapement cam
   12. Platen ratchet teeth
   13. Planetary, sun and ring gears
   14. Index selector guide
   15. Paper release lever cam surface
   16. Carrier clamp cam
   17. Rocker restore cam
   18. Print cams
   19. Ribbon feed cam
   20. Detent cam
   21. Ribbon lift cam
   22. Ribbon cam windows and surface
   23. Ribbon lift adjustment screw
   24. Shift down keylever driver contact point
   25. Escapement magnet pivot plate

INSTALLATION PROCEDURE

A MC/ST trained Customer Engineer must be present to supervise the unpacking of a MC/ST, E/MC, MC II or MC/A. The packing instructions are taped to the top of the console corrugated carton.

Place pre-pack hardware in jiffy bag. Place jiffy bag in flame retardant bag and store in the console.

The following procedure is to be used as a guide for installation of the system. Lifting of the console must be done by a qualified moving company employee, not by the IBM Customer Engineer.

NOTE: Inspect for damage and notify the Customer Engineering Manager if any damage is found.

THE MOVING COMPANY WILL BE RESPONSIBLE FOR THE FOLLOWING:

1. Remove the banding and the corrugated carton.
2. Remove corrugated fold-ups.
3. Remove from foam wraps.
4. Remove console from top of printer.

THE CUSTOMER ENGINEER WILL BE RESPONSIBLE FOR THE FOLLOWING:

MC/ST, E/MC

Printer

1. Remove printer carton.
2. Remove the printer liner and remove the "Vee" hood from the liner.
3. Remove the printer from the base pallet and place in the tilted back position.
4. Remove the wing screws and shipping pallet.
5. Remove the four nylon spacers and rubber washers.
6. Install four feet on bottom of printer.
7. Set the printer down flat and remove all tape.
8. Remove the equipment history card and place in the folder of the console side panel or top cover.
9. Install platen knobs and adjust per Reference Manual.
10. Install "Vee" hood on paper bail.
11. Adjust covers as needed.
12. Install cable clamp on printer cable. Do not overtighten.

Acoustical Filterhood

1. Remove printer center cover.
2. Knock out the two mounting holes from the underside of the center cover just behind the paper table mounting lugs.
3. Mount the support bar and paper gauge assembly to the center cover with two screws and adjust per Reference Manual.
4. Install filterhood and adjust per Reference Manual.
5. Insert paper support rack into support bar.

Console

1. Remove the top cover from the console.
2. Remove RH side panel to locate accessory material.
3. Remove the two screws that mount the front of the card deck to the console rails.
4. Remove the spacers between the front of the card deck and the console rails.
5. Adjust the rear card deck rail mounts per Reference Manual. Install rubber grommets.
6. Remove the left side panel from the console.
7. Remove the cable clamp retainer from the bottom of the console.
8. Route the printer cable up through the bottom of the console and fasten the cable clamp with the retainer.
9. Connect the printer cables to the planar package and the power supply. Caution: make sure keyways line up.
10. Connect the card deck cable (T1) to the power supply. Caution: make sure keyways line up.
11. Connect T4 if E/MC has reverse index or multilingual feature. Be sure keyways line up.
12. Check the planar package and the power supply components for proper mounting and damage.
13. Using the alignment card shipped with the system, check the output of Board "0" in tracks 1, 25 and 50 and record on the machine history card for future reference.
14. Record on history card in "Machine Features/Telephone Info" section if machine is new or recon.
15. Place snap-off connector covers and packing hardware in poly bag and store in console.
16. Level console per Reference Manual.
17. Install all covers on the machine and then perform a complete functional checkout of the entire system.
18. Inform the Branch Office Orders and Movements clerk of the installation.

MC II, MC/A

Printer

1. Open printer carton.
2. Remove the printer liner and remove the Acoustical Filterhood from the liner.
3. Remove the plastic covering and tape from the printer.
4. Remove the printer from the base pallet and place in the tilted back position.
5. Remove the wing screws and shipping pallet.
6. Remove the spacers and install the four printer feet.
7. Install and adjust platen knobs.
8. Remove the equipment history card and install in the folder of the console top cover.
9. Install the Acoustical Filterhood and paper table.
10. Adjust the Acoustical Filterhood and the covers as needed.

Console

1. Remove the plastic cover and tape from the console.
2. Remove the console top and side cover.
3. Remove 2 screws and spacers that secure the front of the card deck and retain.
4. Remove the bolt, nut and spacer which secures the rear of the card and retain.
5. Store the hold down screws and spacers in the console holes provided under the card deck.
6. Install cable clamp onto cable, route cable through the rear of console, position cable and tighten clamp.
   Caution: Do not overtighten cable clamp.
7. Connect the printer cables to the planar package and the power supply.
   Caution: Make sure keyways line up.
8. Check the planar package and the power supply components for proper mounting and damage.
9. Using the mastercard shipped with the system, check Board "0" output in tracks 1, 25 and 50 and record on the machine history card for future reference.

(Cont.)

Console (Cont.)

10. Record on history card in "Machine Features/Telephone Info" section if machine is new or recon.
11. Place snap-off connector covers and packing hardware in poly bag and store in console.
12. Level console per Reference Manual.
13. Install all covers and perform a functional checkout of the entire system.
14. Inform the Branch Office Orders and Movements Clerk of the installation.

INSTALLATION PROCEDURE MEM/T

1. Remove straps from around box and pallet assembly. Open box.
2. Remove coiled linecord from slot in rear of liner.*
3. Remove liner from around machine. Remove poly bag from over machine.*
4. Tilt unit on its back. Remove thumbscrews and pallet.*
5. Remove machine from box.
6. Remove filament tape from top cover, center cover, paper table and acoustic hood.
7. Plug in machine and turn power on. Move carrier to center of writing line.
8. Disengage right and left platen knobs. Unlatch and remove covers.
9. Tilt up printer in cover and remove spacers from shipping hole wells.
10. Remove retainer from between head pad arm and drive casting.
11. Connect both tape loop pressure drive roller springs.
12. Lower printer. Select track 51 and load into memory. Reposition knob and secure setscrew.
13. Replace and relatch covers. Reconnect platen knobs.
14. Perform a complete functional check.
15. Record on history card in "Machine Features/Telephone Info" section if machine is new or recon.

* Not required for foam pack. Remove shipping screws.

INSTALLATION PROCEDURE E.S.C.

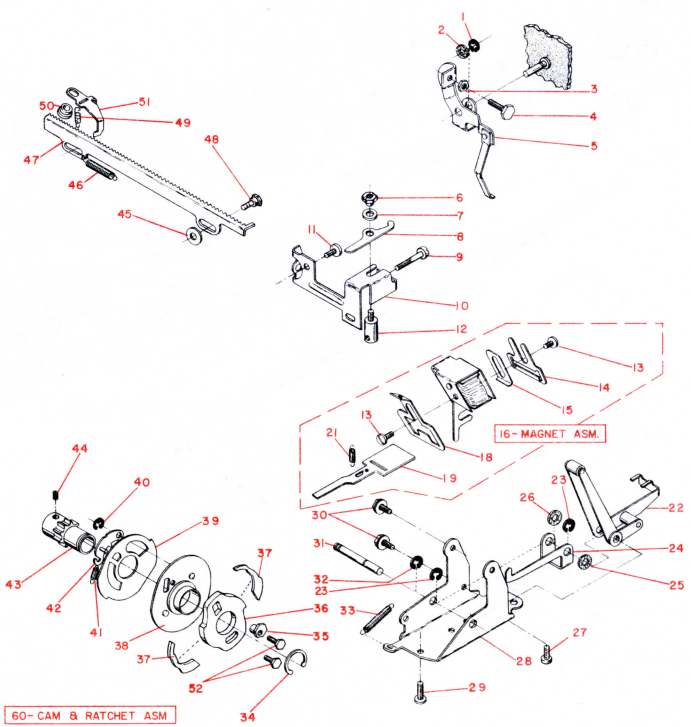
1. Remove straps from around box and pallet assembly. Open box.
2. Remove coiled linecord from slot in rear of liner.*
3. Remove liner from around machine Remove poly bag from over machine.*
4. Tilt unit on its back. Remove thumbscrews and pallet.*
5. Remove machine from box.
6. Remove filament tape from top cover, center cover, paper table and acoustic hood.
7. Plug in machine and turn power on. Move carrier to center of writing line.
8. Disengage right and left platen knobs. Unlatch and remove covers.
9. Tilt up printer in cover and remove spacers from shipping hole wells.
10. Lower printer, replace and relatch covers. Reconnect platen knobs.
11. Perform a complete functional check.
12. Record on history card in "Machine Features/Telephone Info" section if machine is new or recon.

* Not required for foam pack. Remove shipping screws.

NOTE: Prepack Hardware Should Be Saved For Machine Discontinuance.

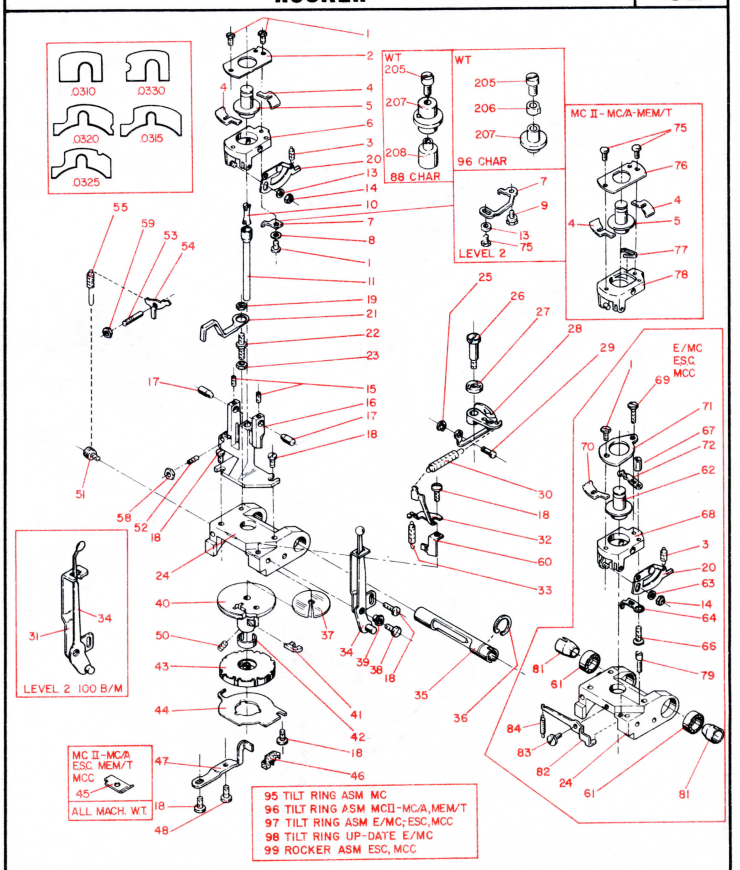
BACKSPACE
MC

MECH. CODE 01



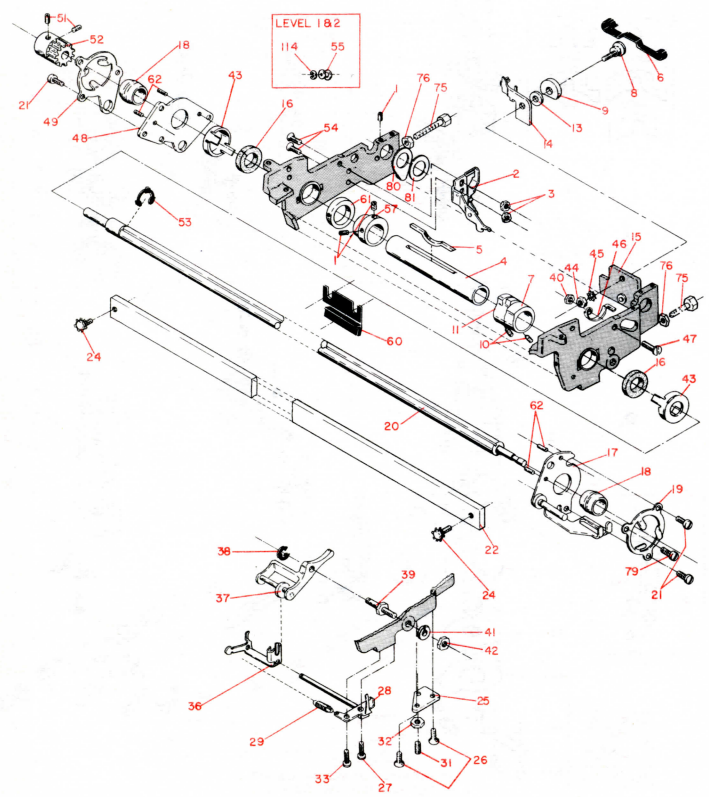
ROCKER

MECH. CODE 02



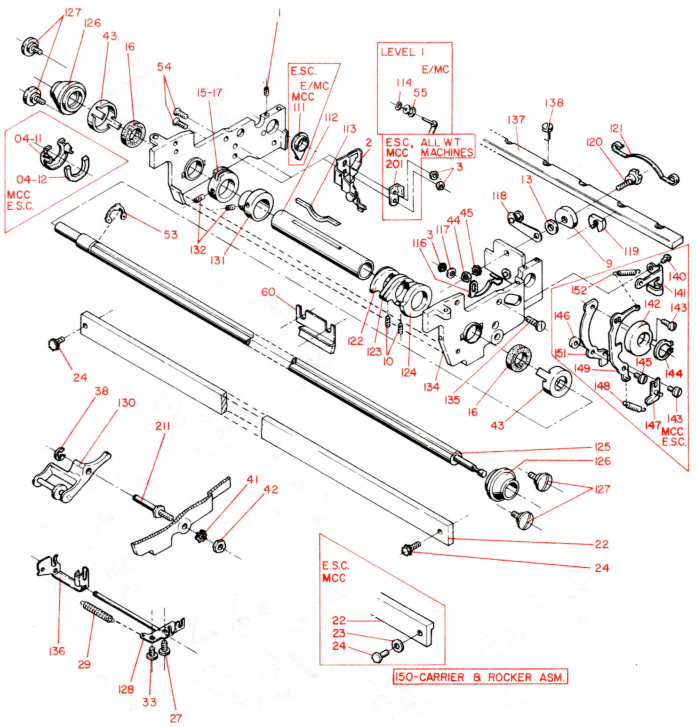
MECH. CODE **03**

CARRIER
MC



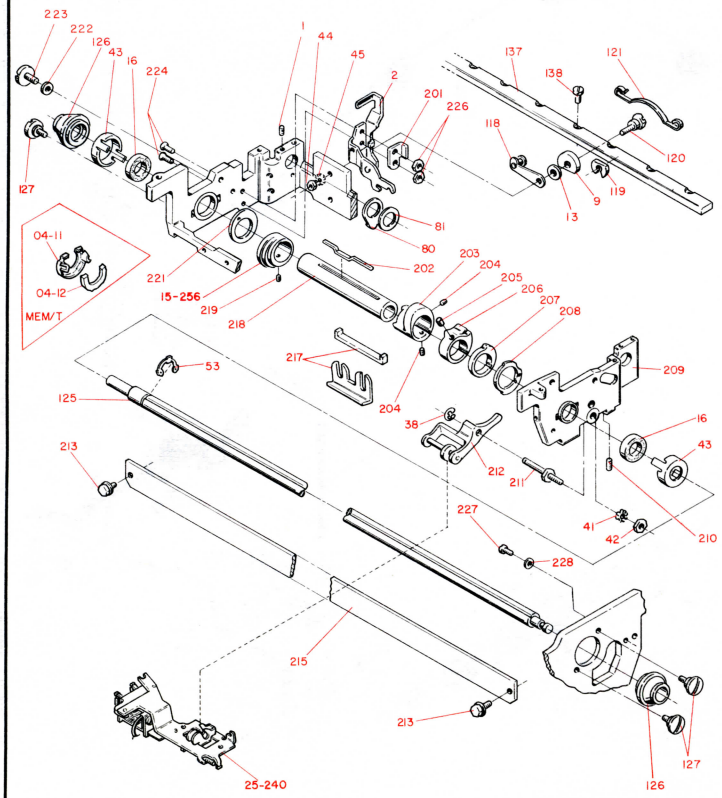
MECH. CODE **03**

CARRIER
E/MC – ESC – MCC



CARRIER
MC II – MC/A – MEM/T

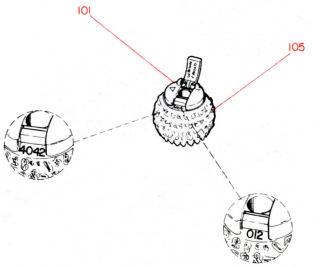
MECH. CODE 03



250-CARRIER ROCKER ASM.

TYPE ELEMENTS & FONTS

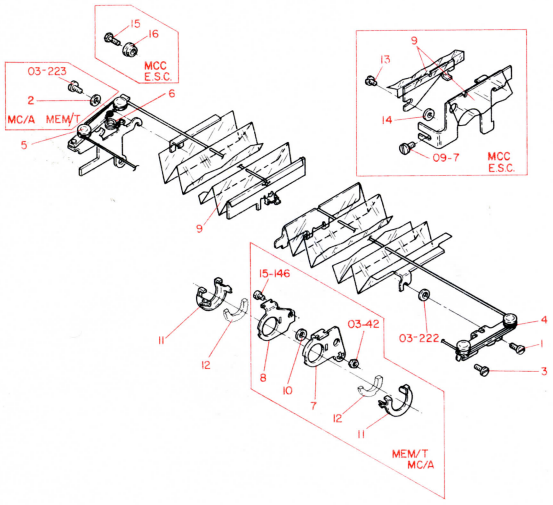
MECH. CODE 03



106-W.T.

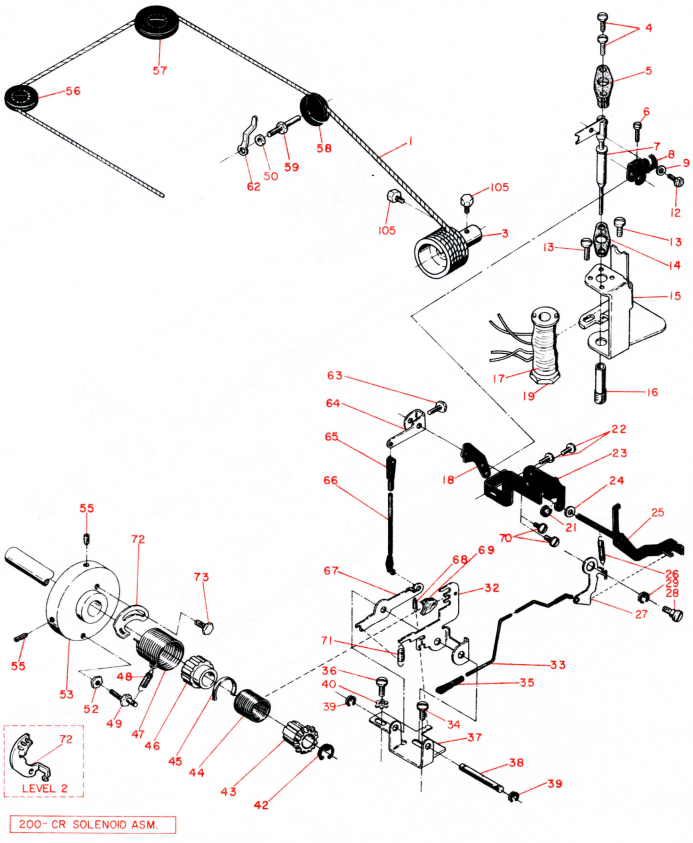
MECH. CODE **04**

PRINT SHAFT COVER



MECH. CODE **05**

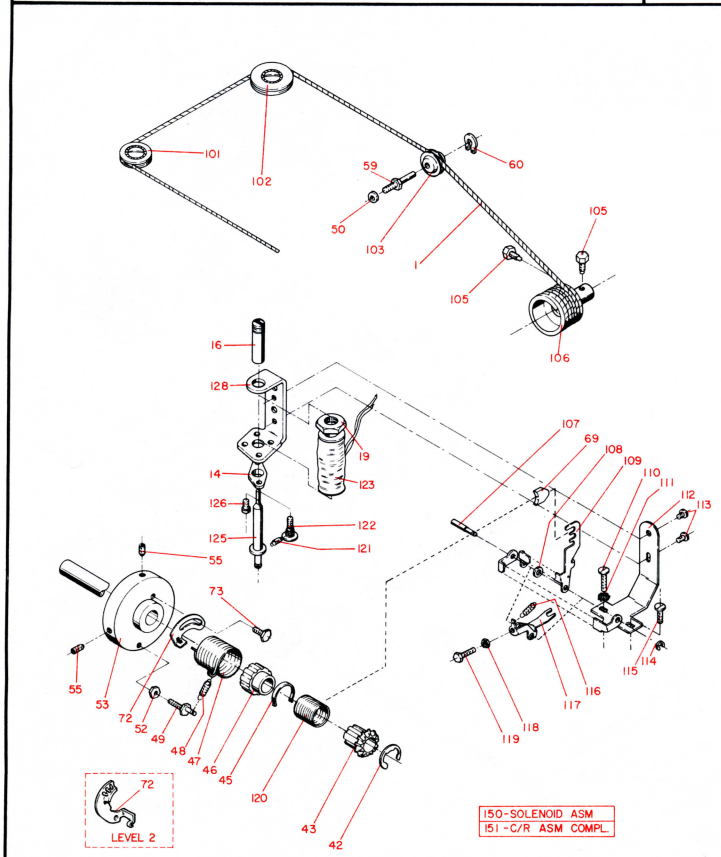
CARRIER RETURN
MC



CARRIER RETURN

E/MC – MC II – MC/A – MEM/T – ESC – MCC

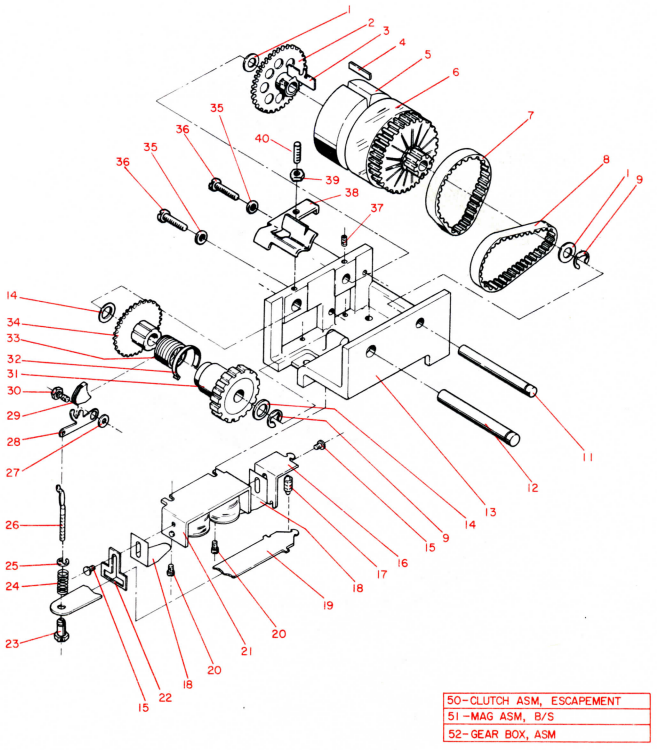
MECH. CODE 05



LEADSCREW DRIVE

E/MC – MC II – MC/A – MEM/T – ESC – MCC

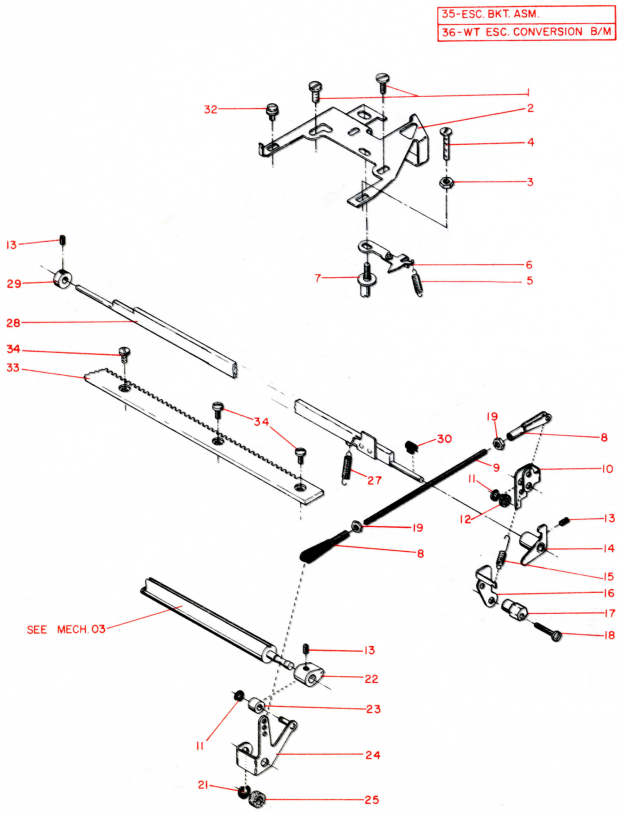
MECH. CODE 06



MECH. CODE **07**

ESCAPEMENT

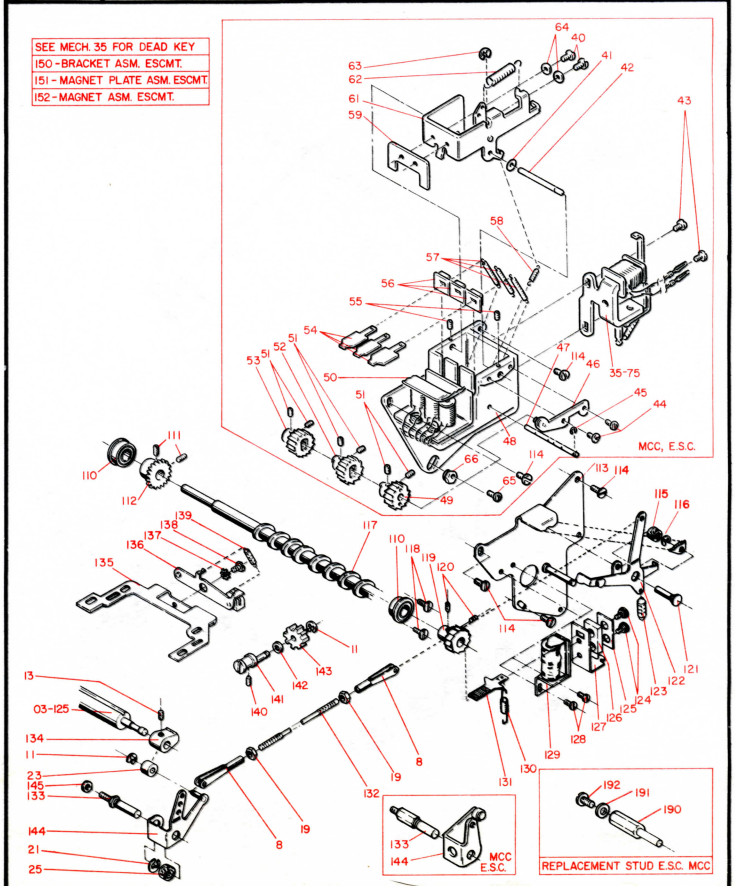
MC



MECH. CODE **07**

ESCAPEMENT

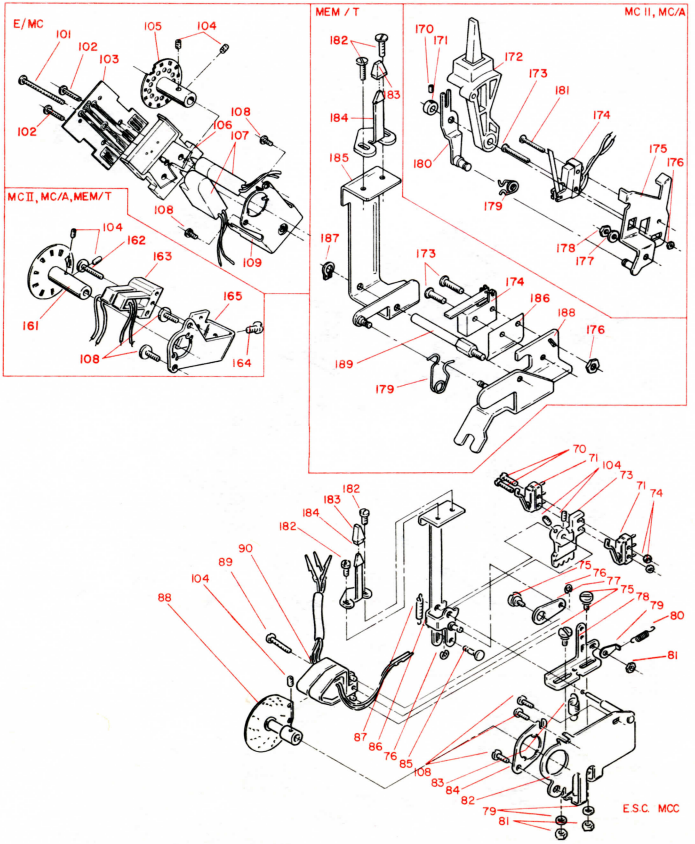
E/MC – MC II – MC/A – MEM/T – ESC – MCC



ESCAPEMENT

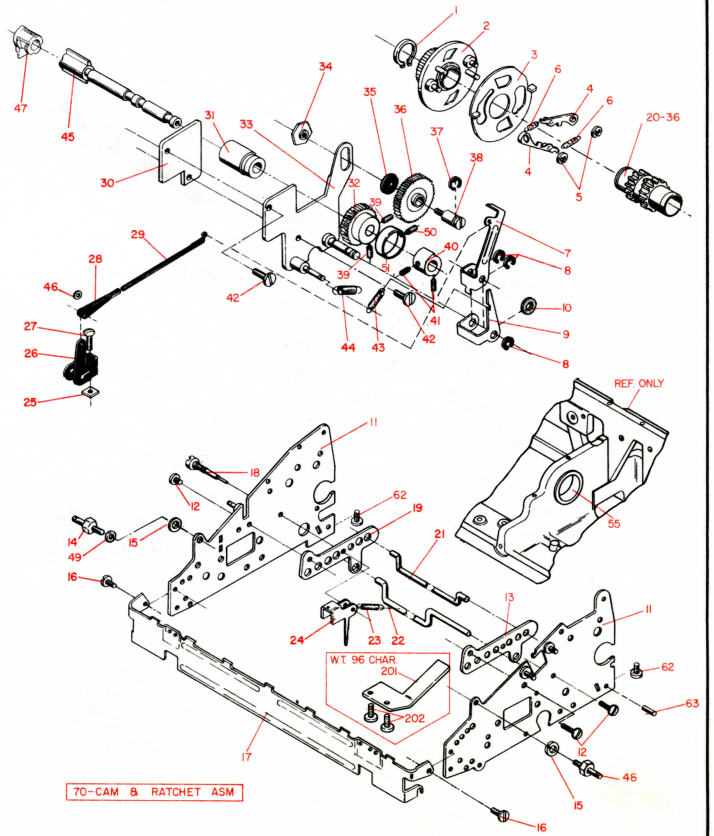
E/MC — MC II — MC/A — MEM/T — ESC — ESC

MECH. CODE 07



FRAMES, FILTER SHAFT & CLUTCH

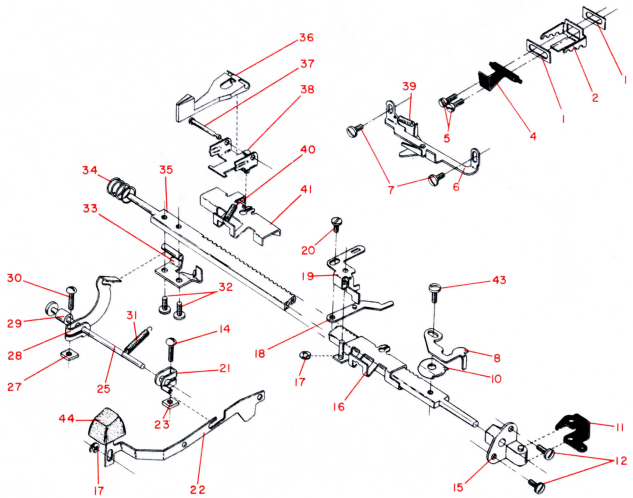
MECH. CODE 08

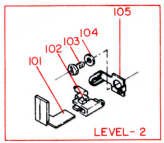


MECH. CODE **09**

MARGIN

MC

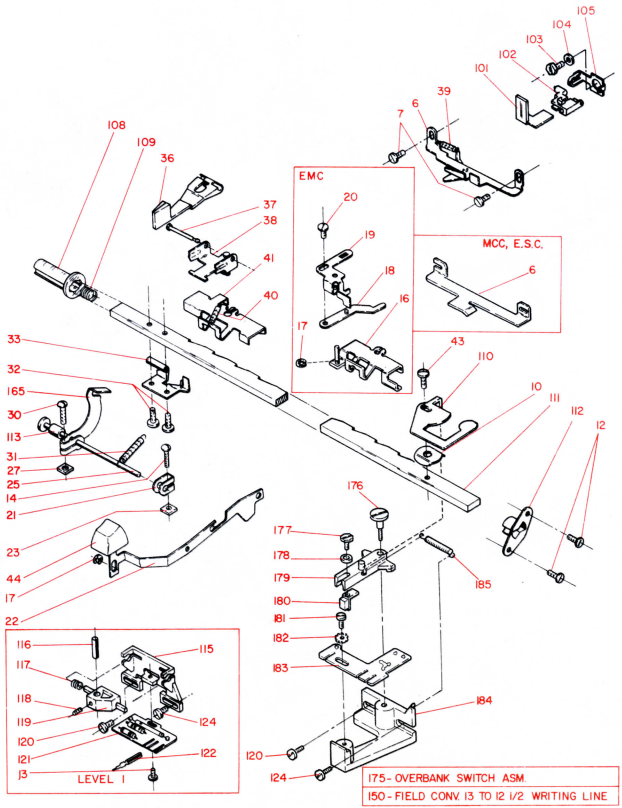




MECH. CODE **09**

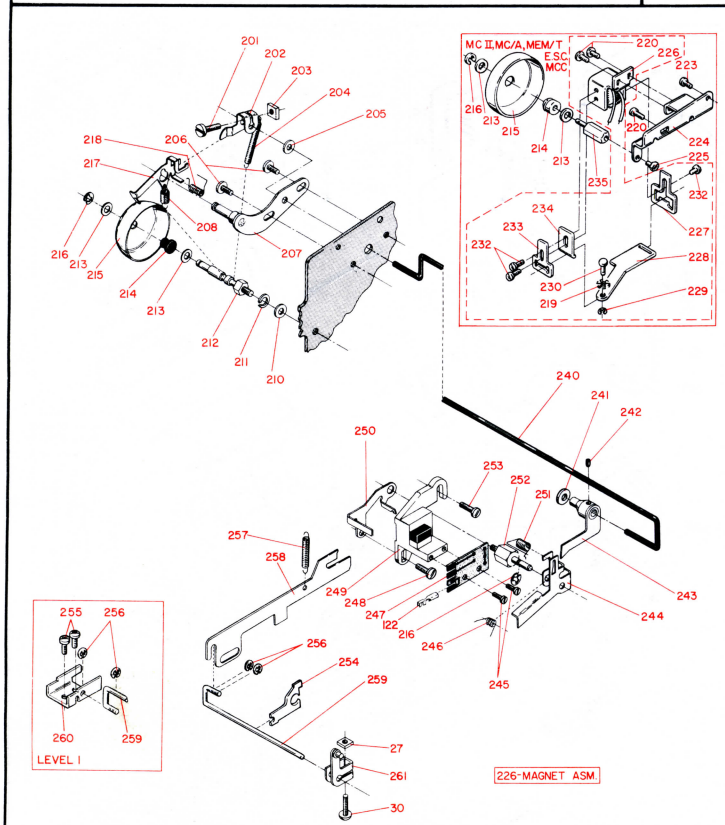
MARGIN

E/MC – MC II – MC/A – MEM/T – ESC – MCC



LINELOCK & BELL

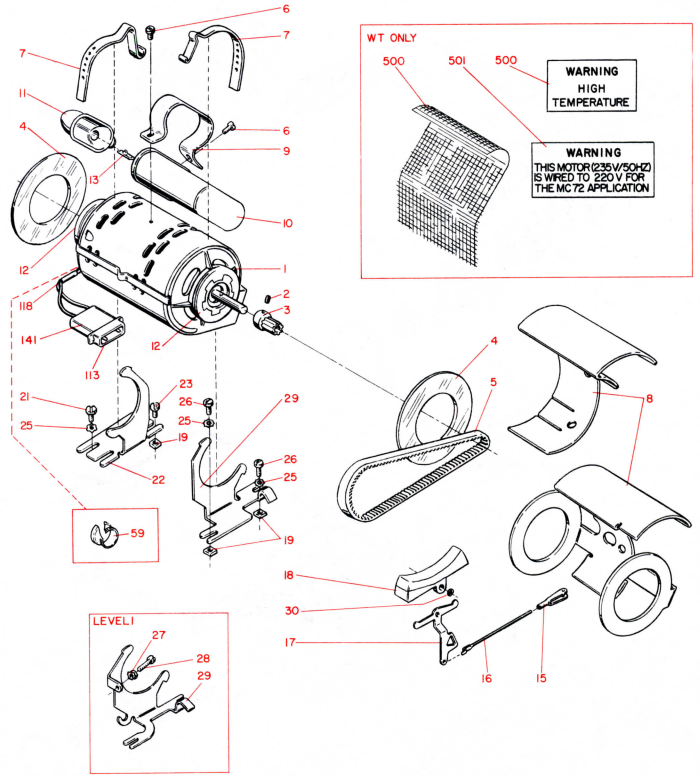
MECH. CODE 09



MOTOR & DRIVE

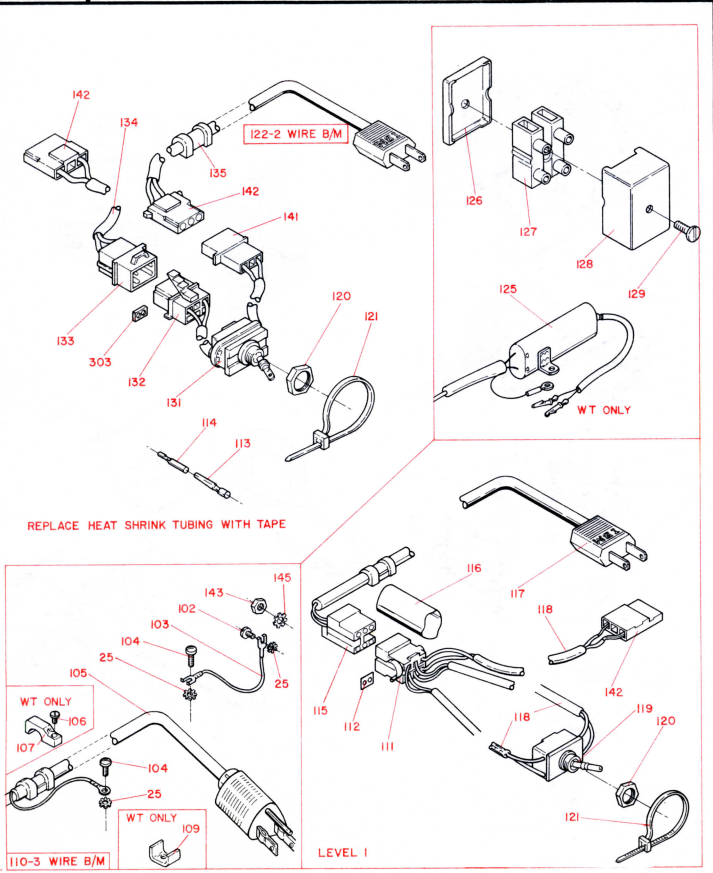
MC

MECH. CODE 11



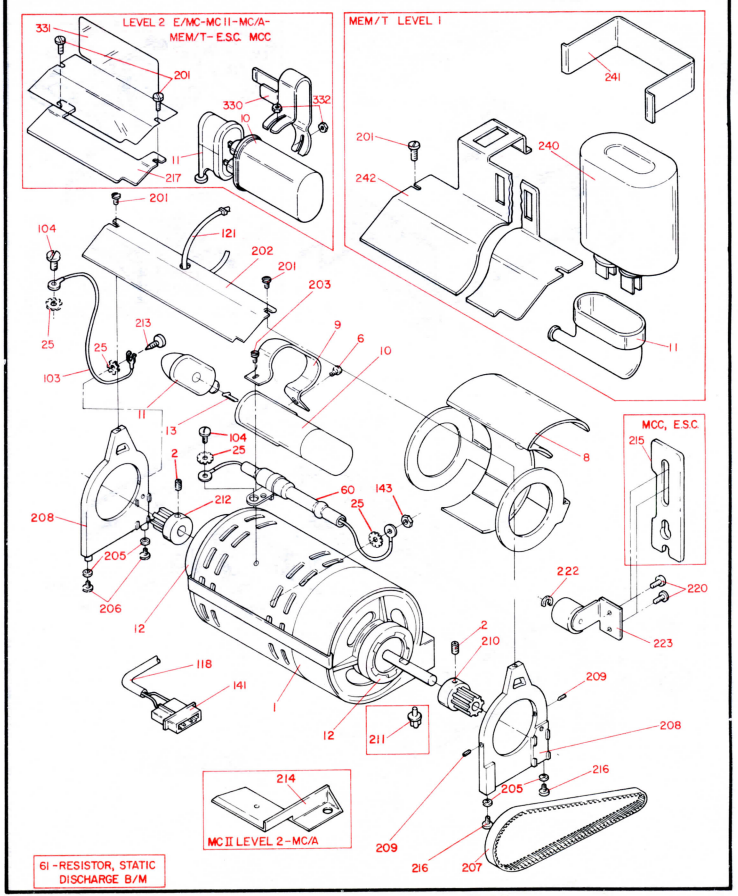
MECH. CODE 11

MOTOR & DRIVE
MC



MECH. CODE 11

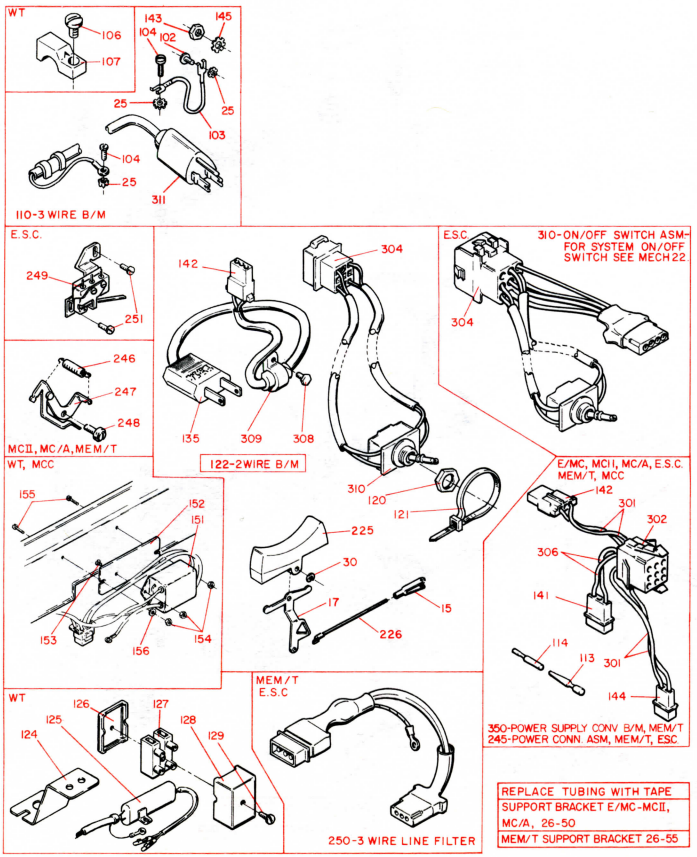
MOTOR & DRIVE
E/MC – MC II – MC/A – MEM/T – ESC – MCC



MOTOR & DRIVE

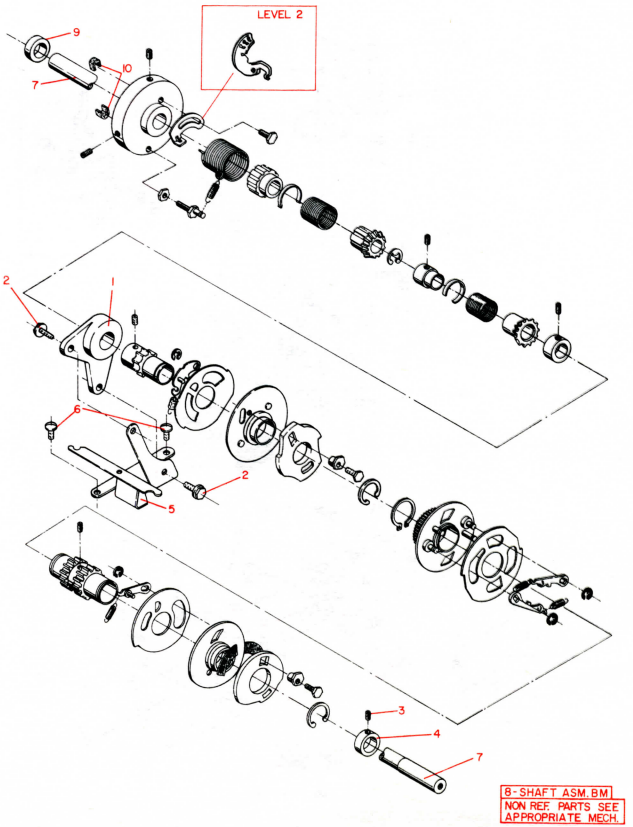
E/MC — MC II — MC/A — MEM/T — ESC — MCC

MECH. CODE 11



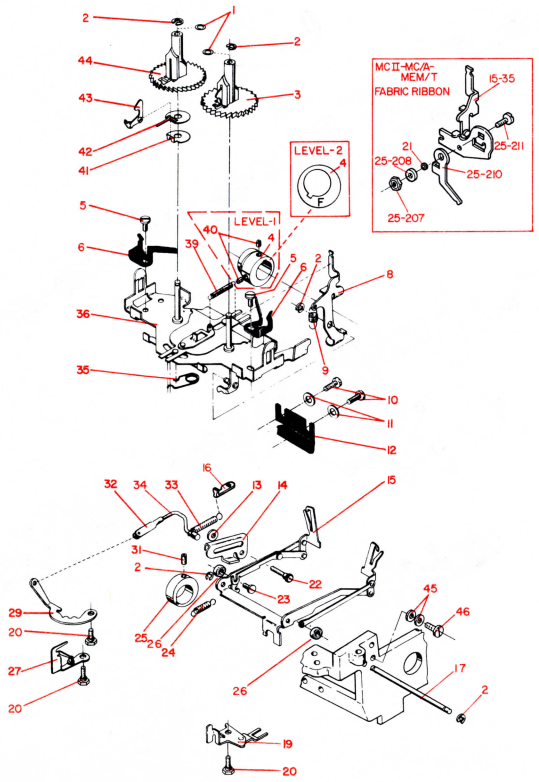
OPERATIONAL SHAFT

MECH. CODE 12



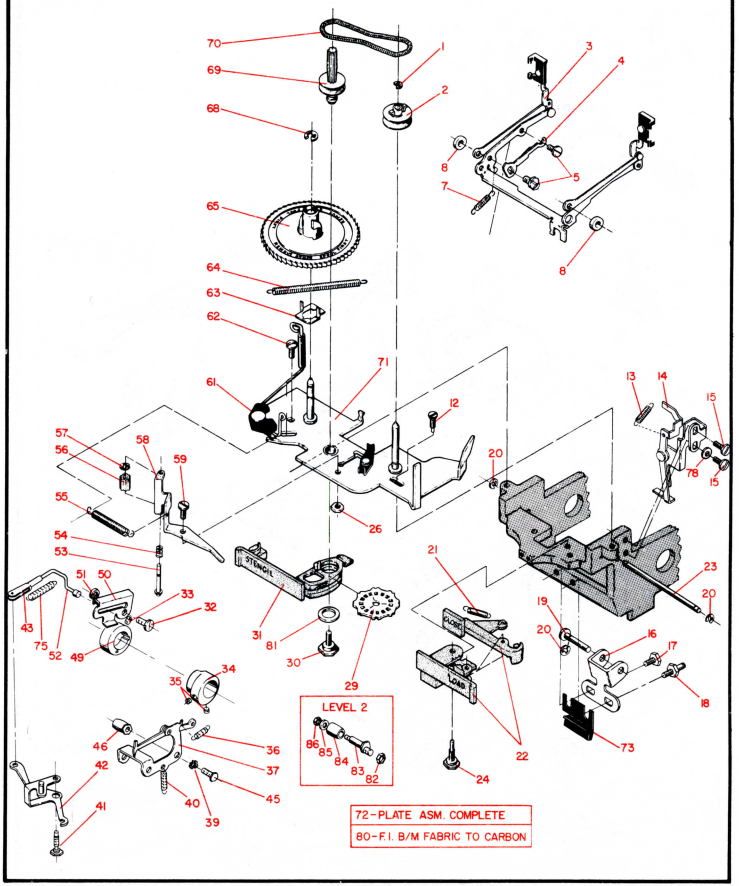
MECH. CODE **13**

FABRIC RIBBON



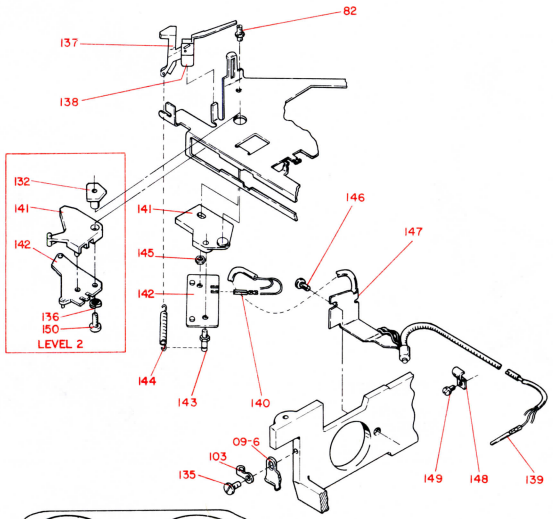
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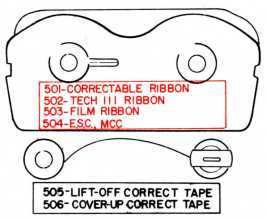
FILM RIBBON



END OF RIBBON

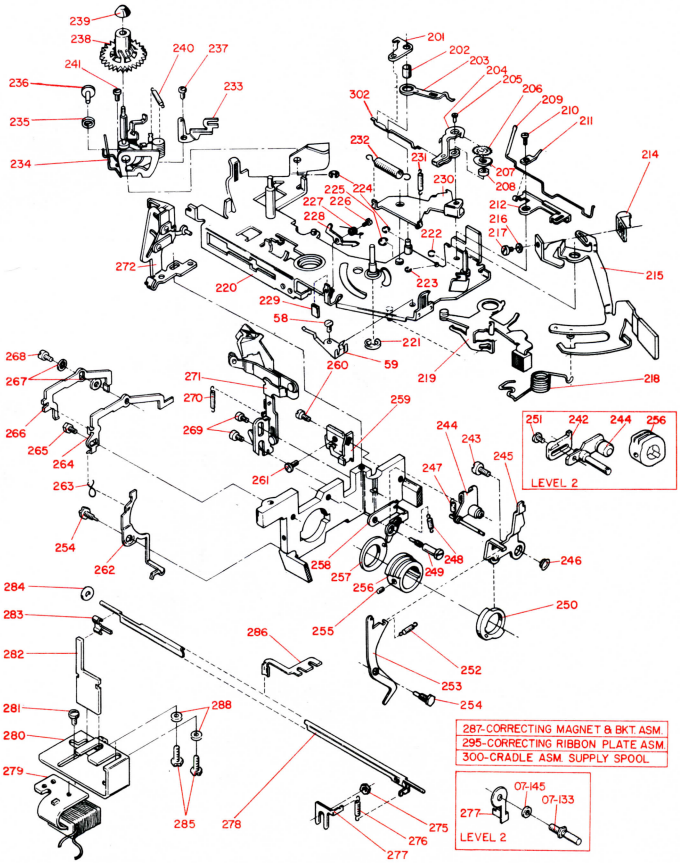
MECH. CODE 15





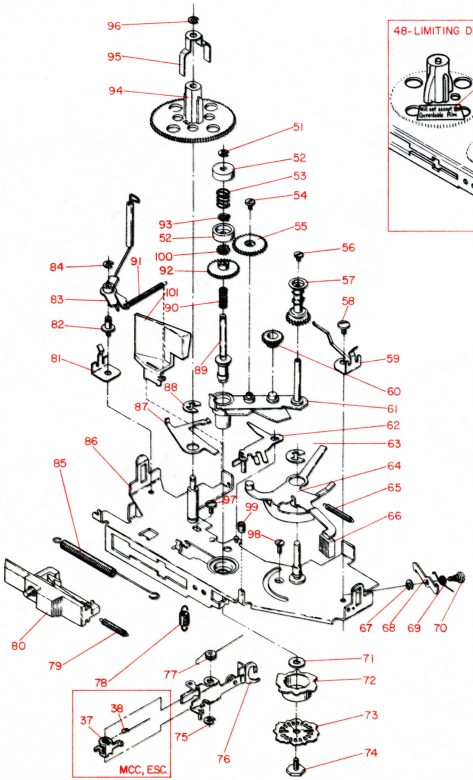
CORRECTING RIBBON

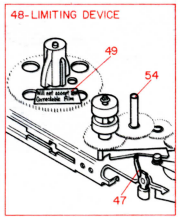
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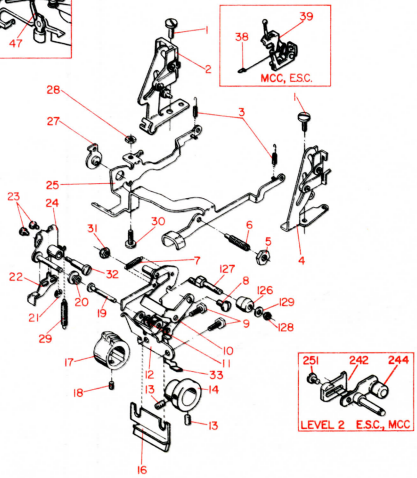


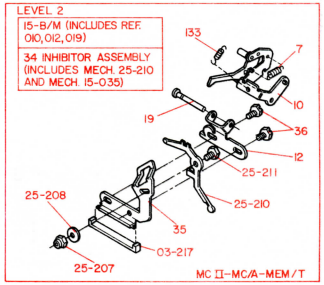
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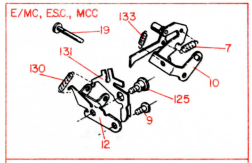
SELECTIVE RIBBON

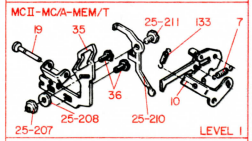


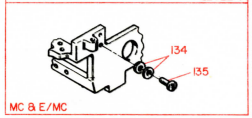








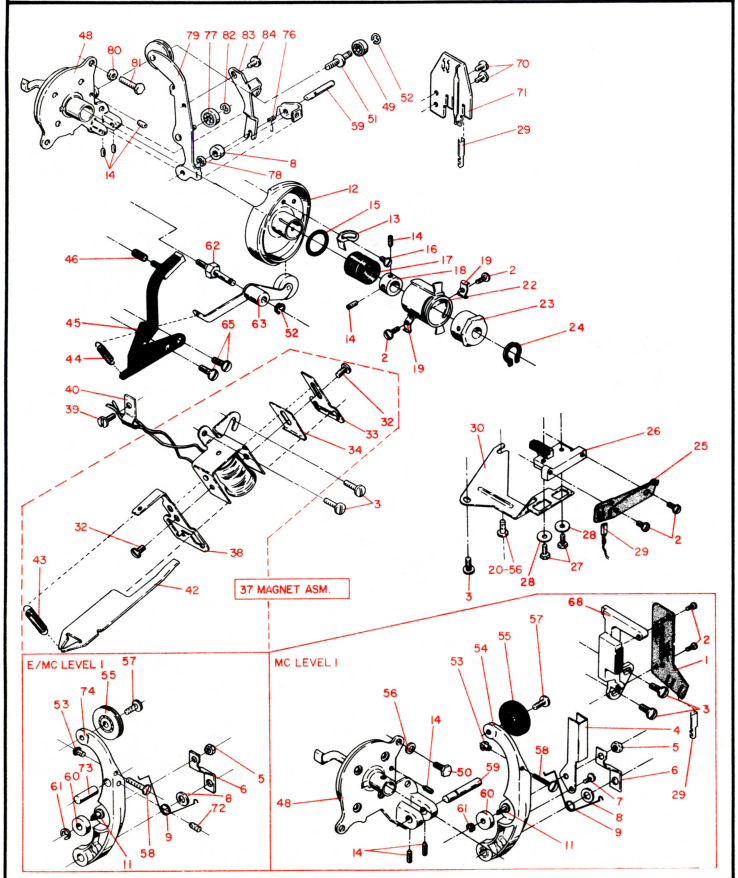




151-RIBBON PLATE ASM.
102-RIBBON FEED GEAR B/M

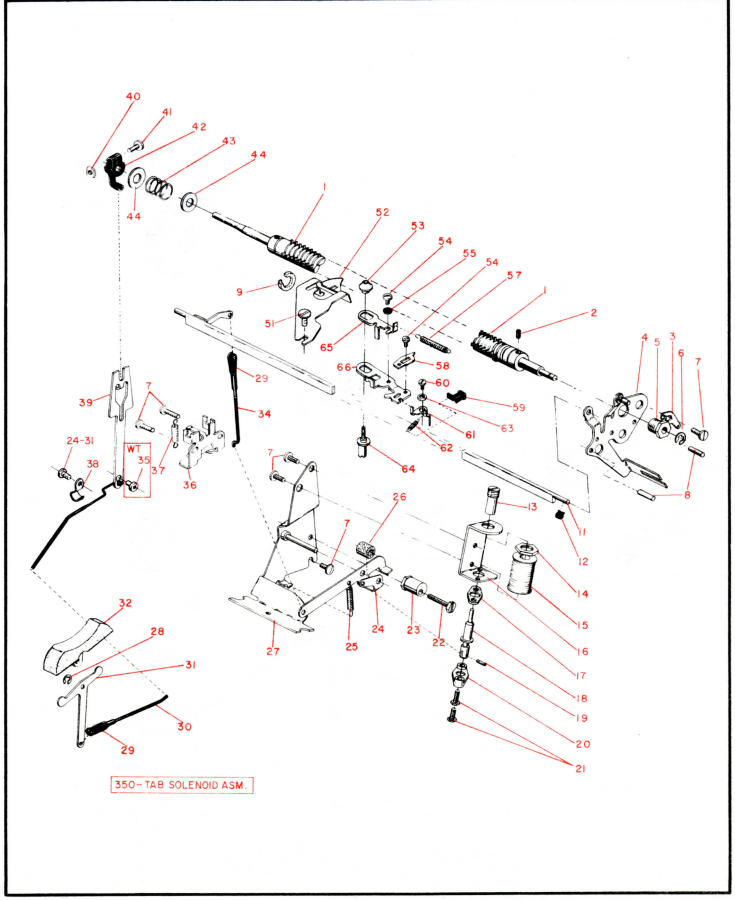
SHIFT

MECH. CODE 16



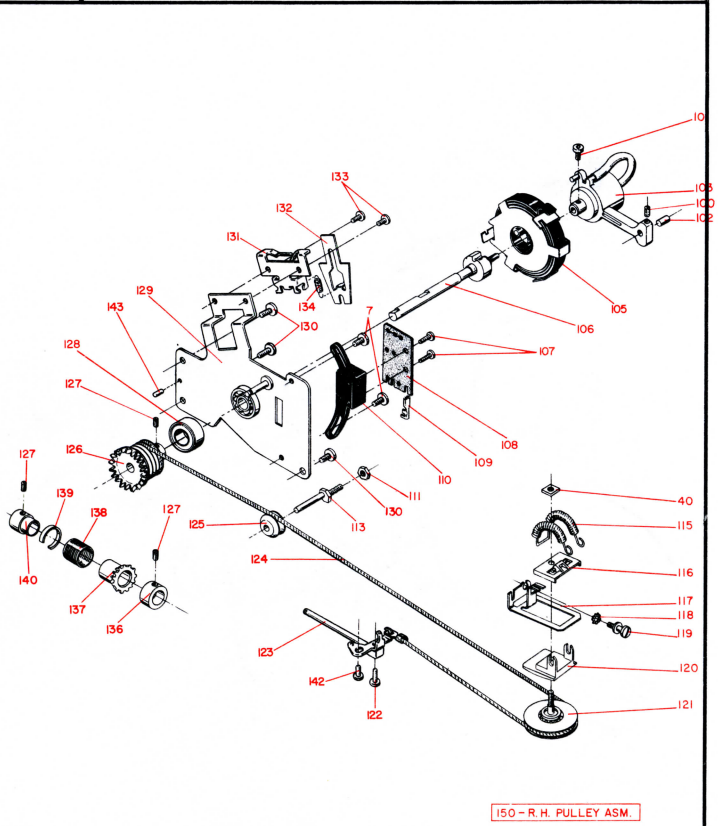
TAB
MC

MECH. CODE 18



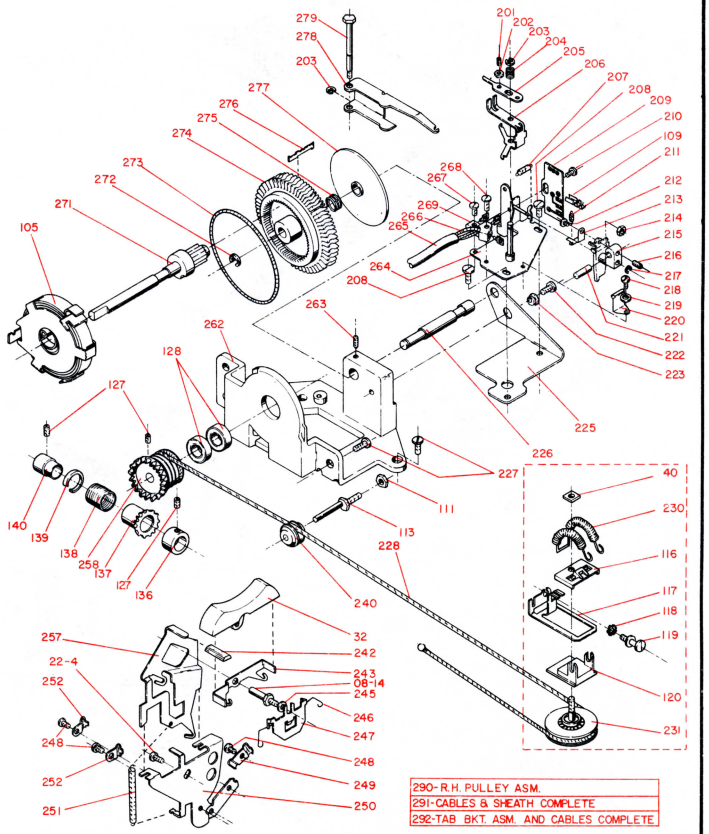
MECH. CODE **18**

TAB
MC



MECH. CODE **18**

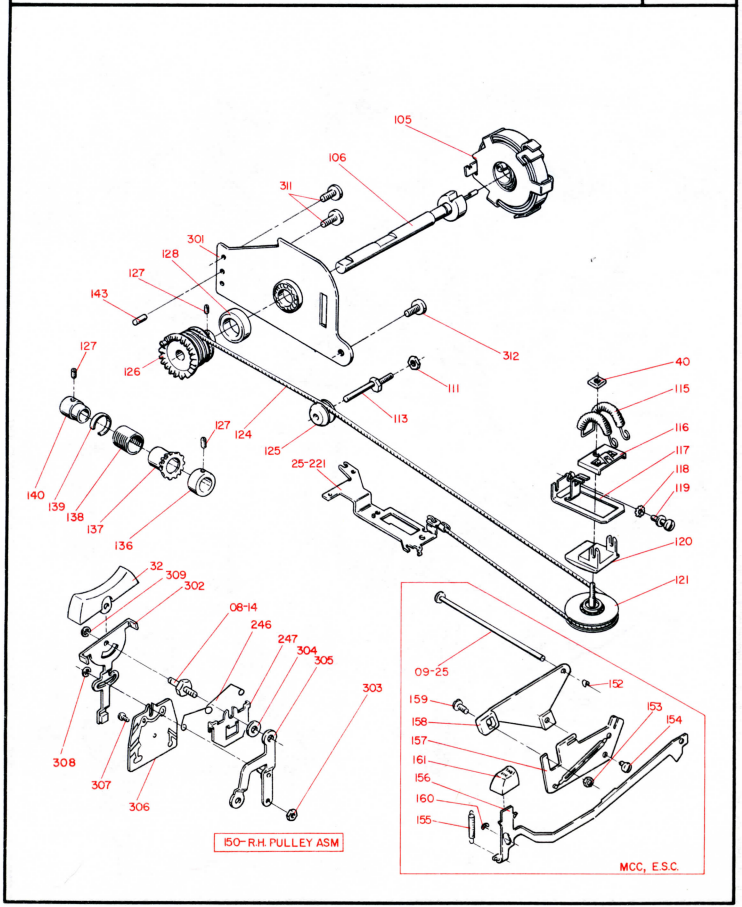
ROTARY TAB
E/MC



TAB

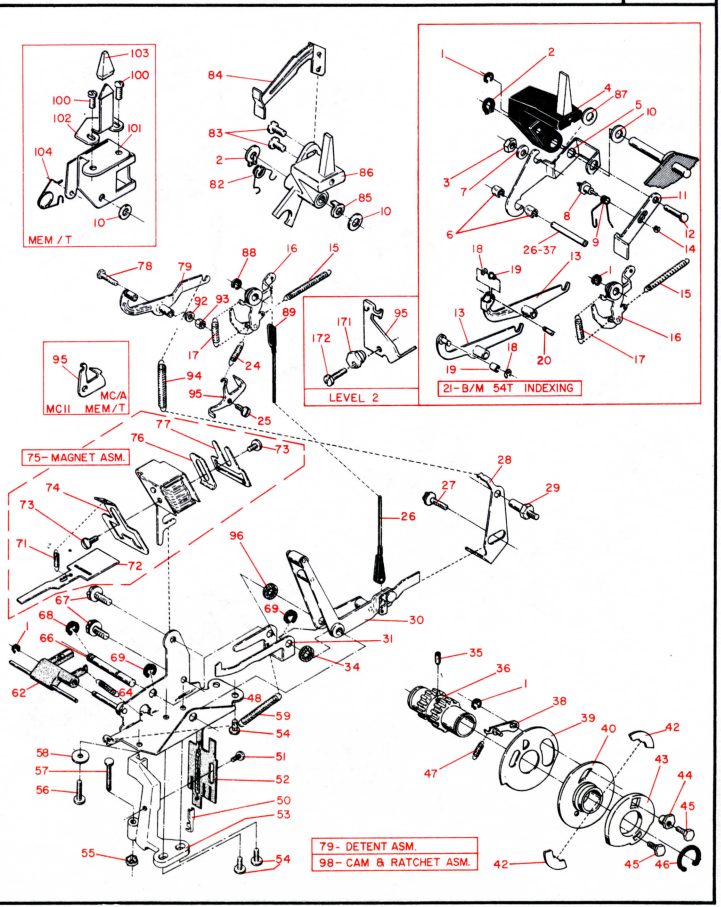
MC II – MC/A – MEM/T – ESC – MCC

MECH. CODE 18



INDEXING

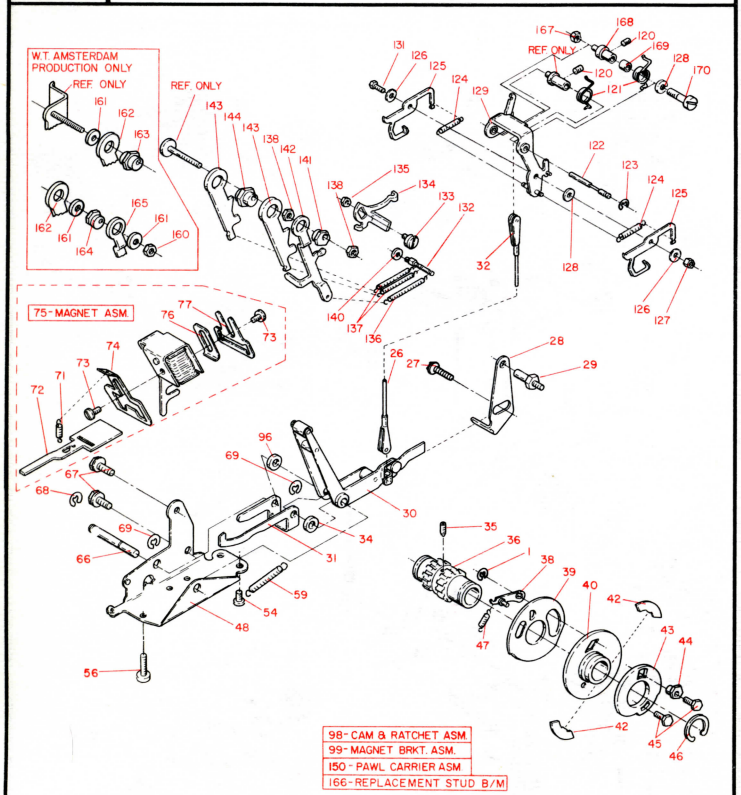
MECH. CODE 20



MECH. CODE **20**

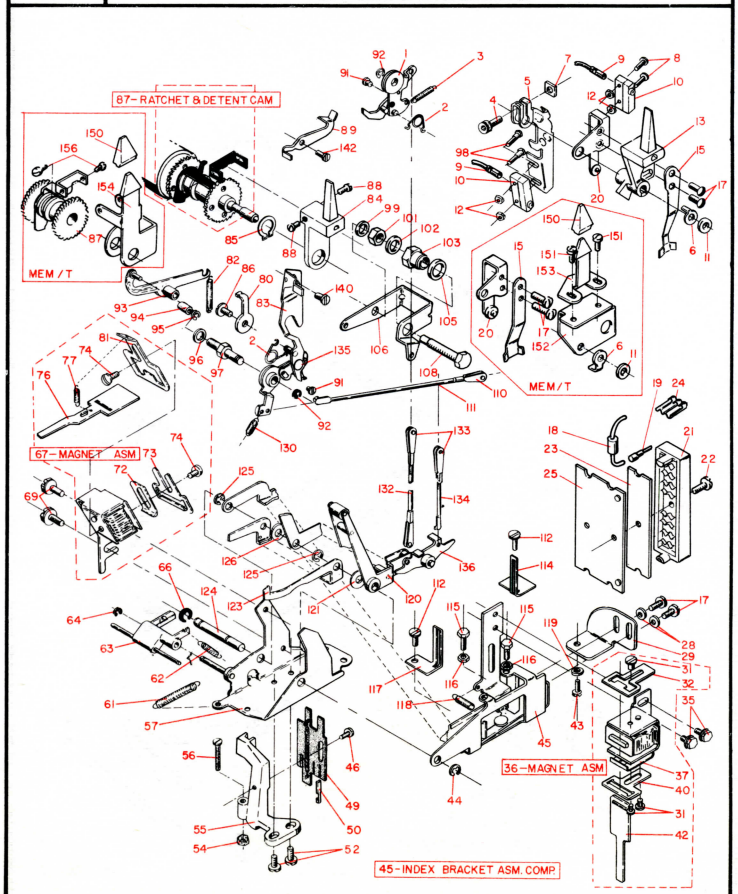
INDEXING

ESC — MCC



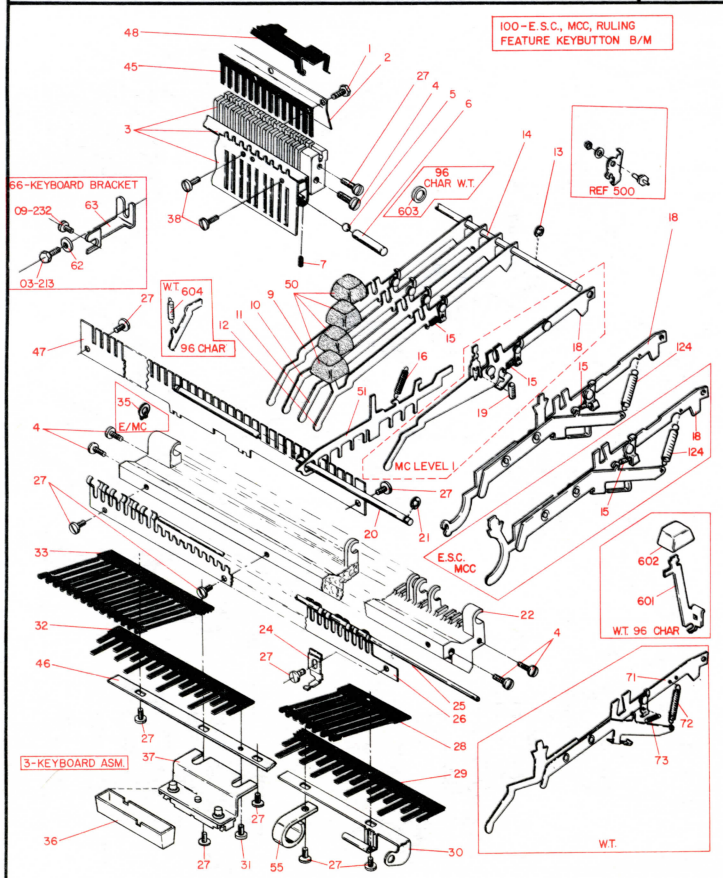
MECH. CODE **21**

REVERSE INDEXING



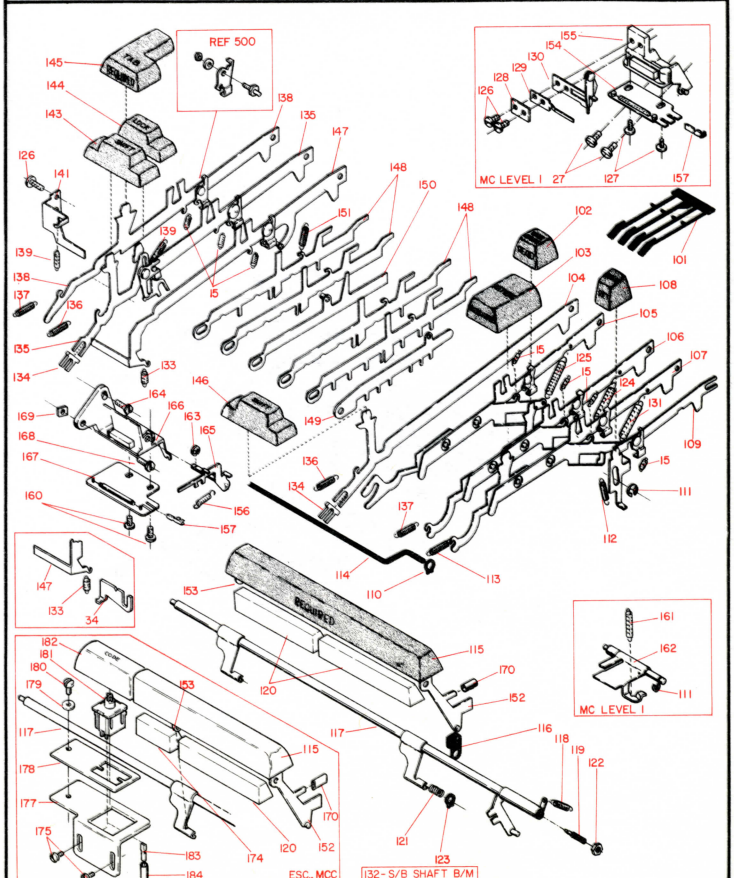
KEYBOARD SELECTION

MECH. CODE 22



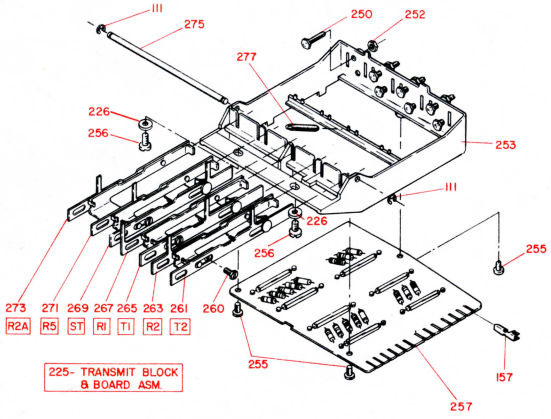
KEYBOARD SELECTION

MECH. CODE 22



MECH. CODE 22

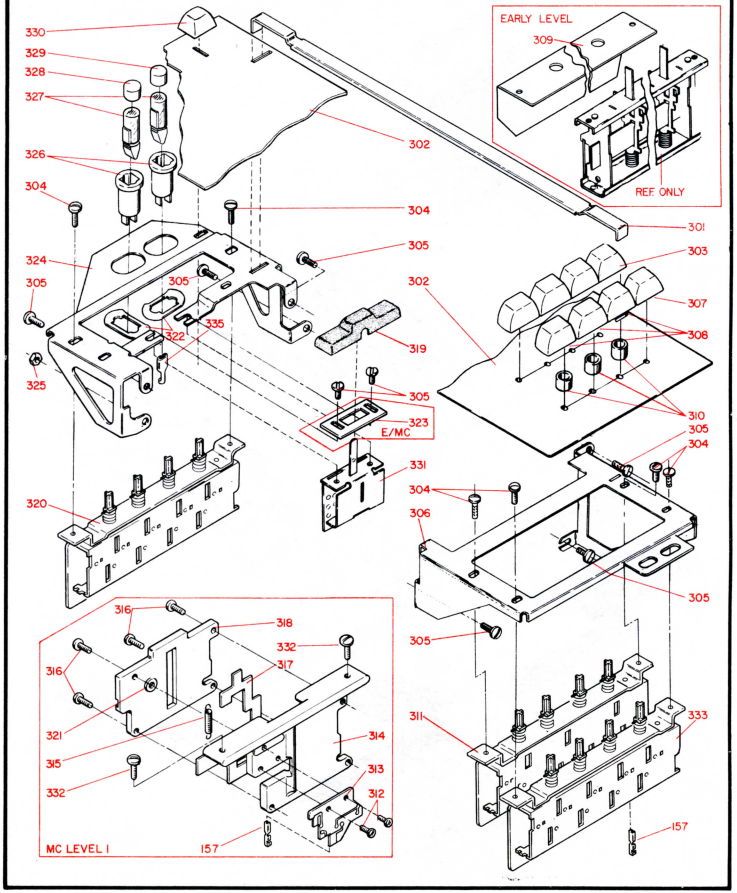
TRANSMIT BLOCK



225- TRANSMIT BLOCK & BOARD ASM.

MECH. CODE 22

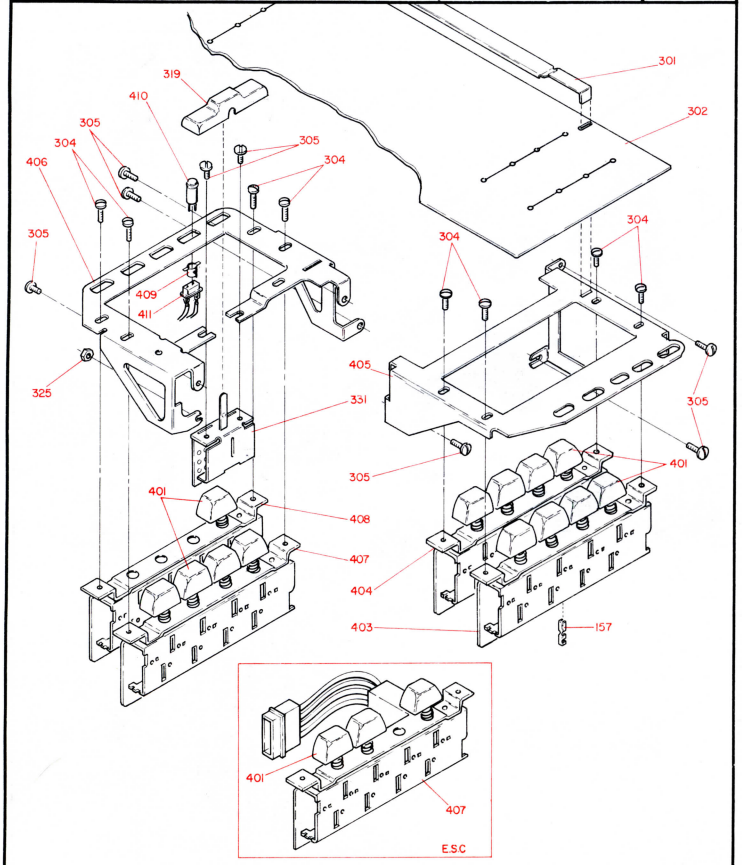
KEYBOARD SWITCHES
MC – E/MC



KEYBOARD SWITCHES

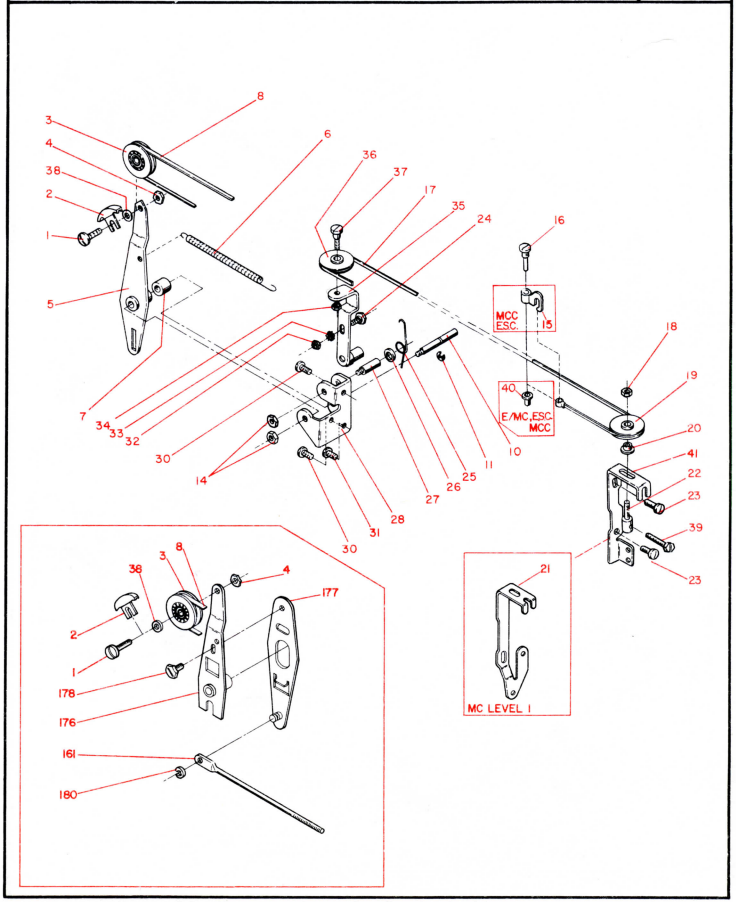
MC II – MC/A – MEM/T – ESC – MCC

MECH. CODE 22



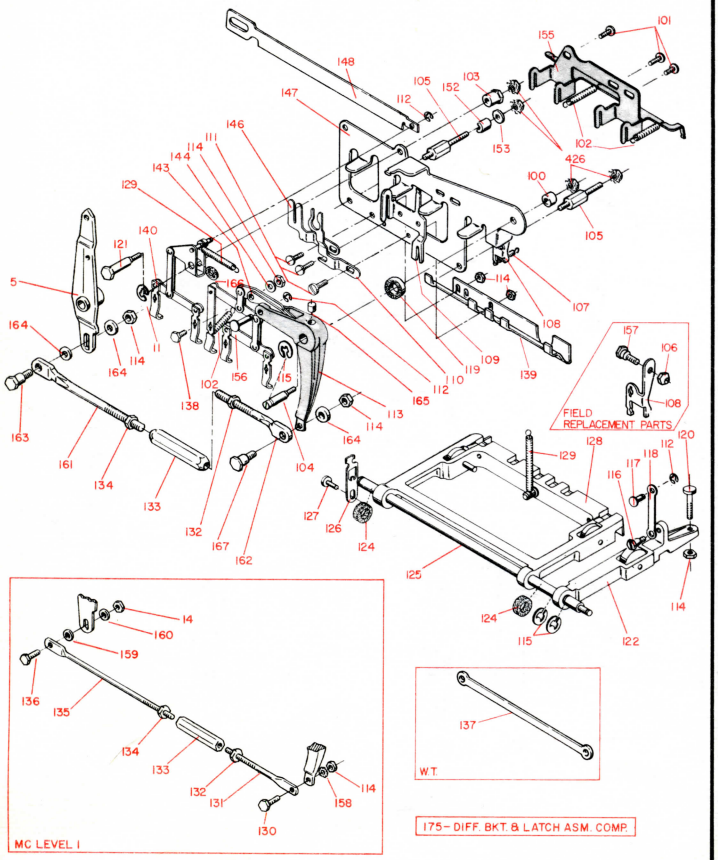
CHARACTER SELECTION

MECH. CODE 24



MECH. CODE **24**

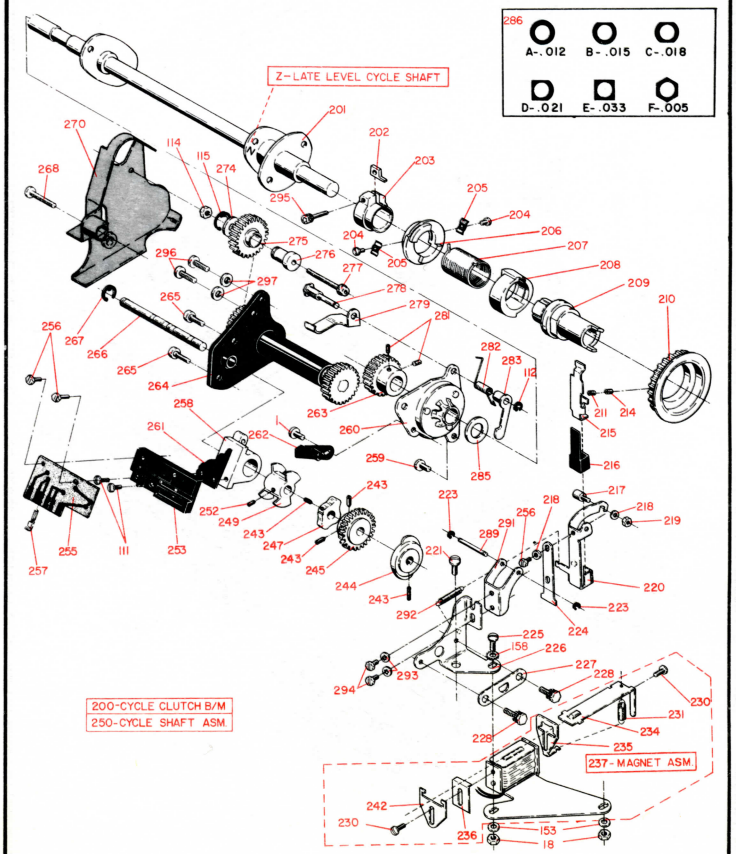
CHARACTER SELECTION



MECH. CODE **24**

CYCLE SHAFT & CLUTCH

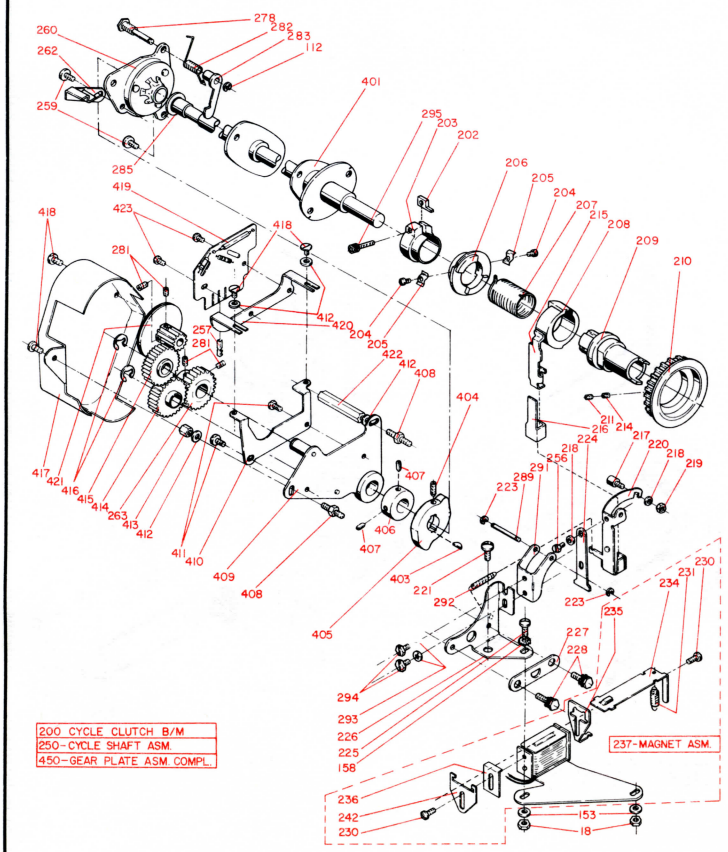
MC



CYCLE SHAFT & CLUTCH

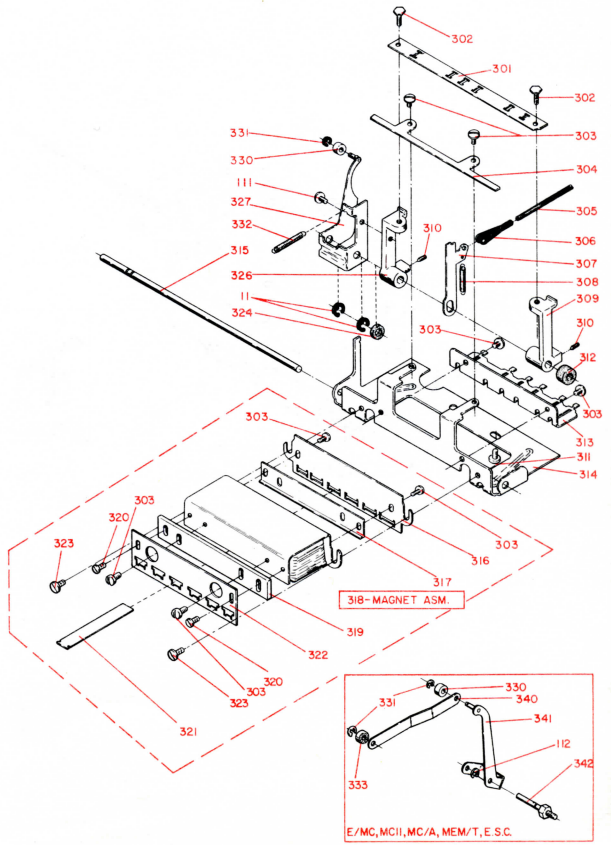
E/MC – MC II – MC/A – MEM/T – ESC – MCC

MECH. CODE 24



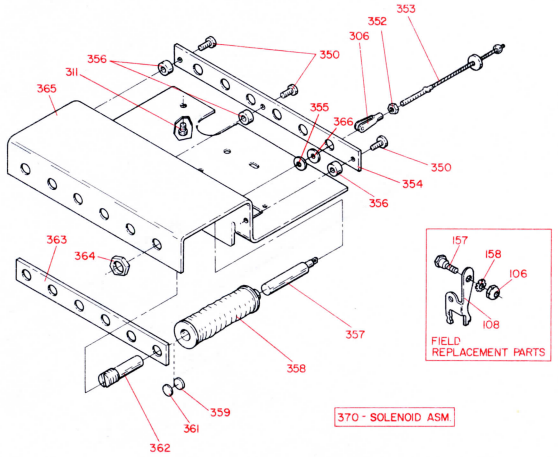
MAGNET SELECTION

MECH. CODE 24



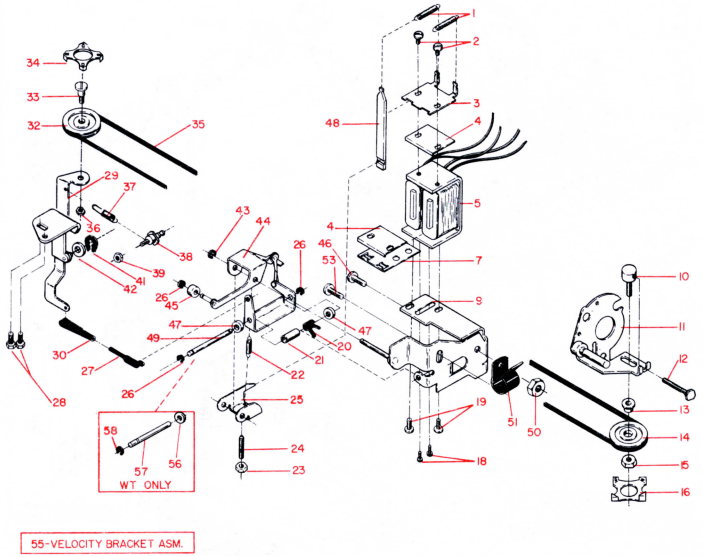
MECH. CODE **24**

SOLENOID SELECTION



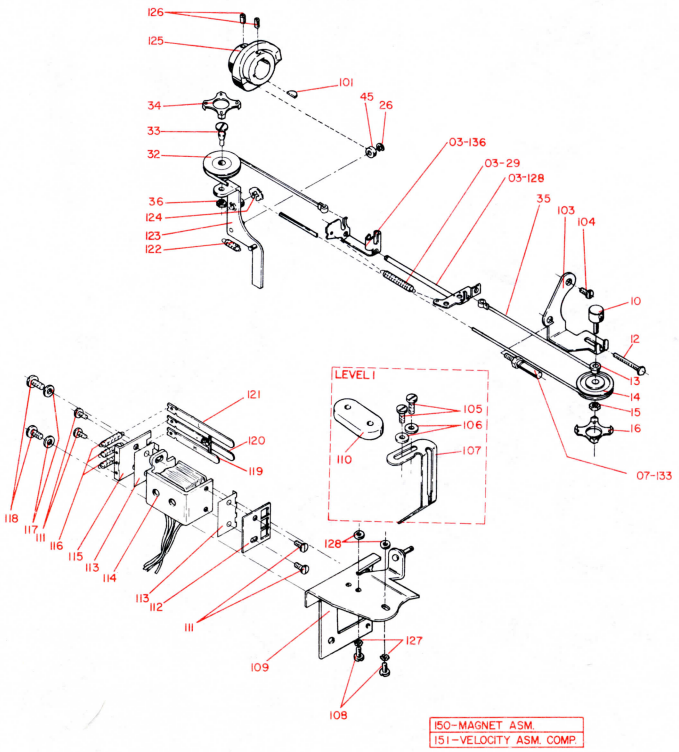
MECH. CODE **25**

VELOCITY
MC



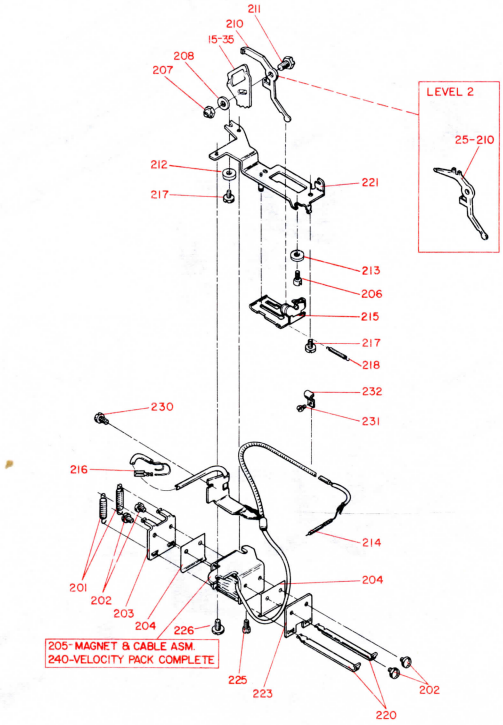
VELOCITY
E/MC — ESC — MCC

MECH. CODE 25



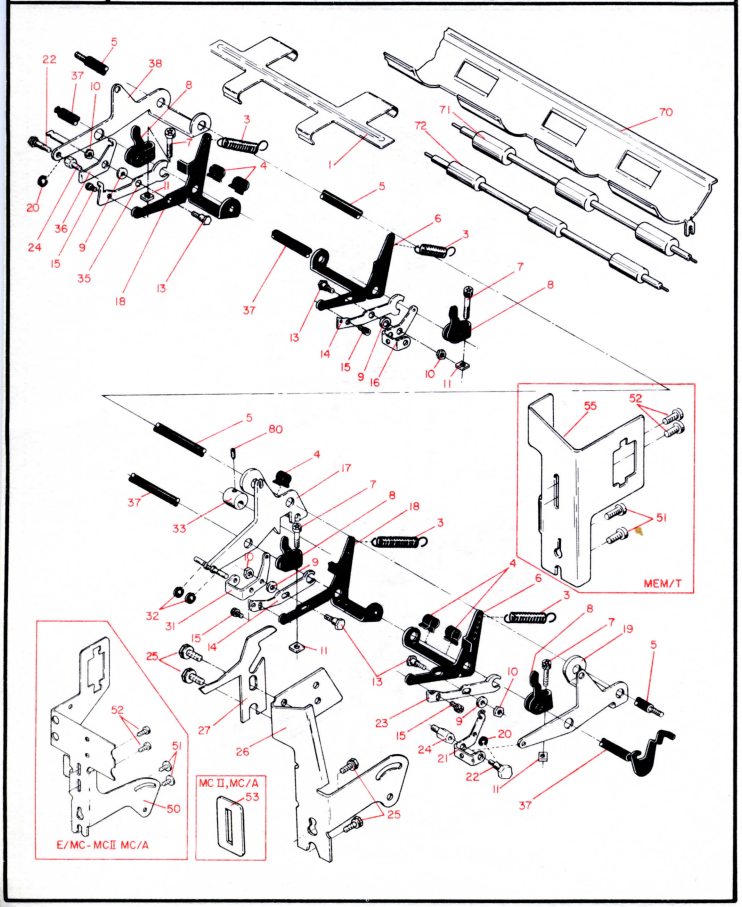
VELOCITY
MC II — MC/A — MEM/T

MECH. CODE 25



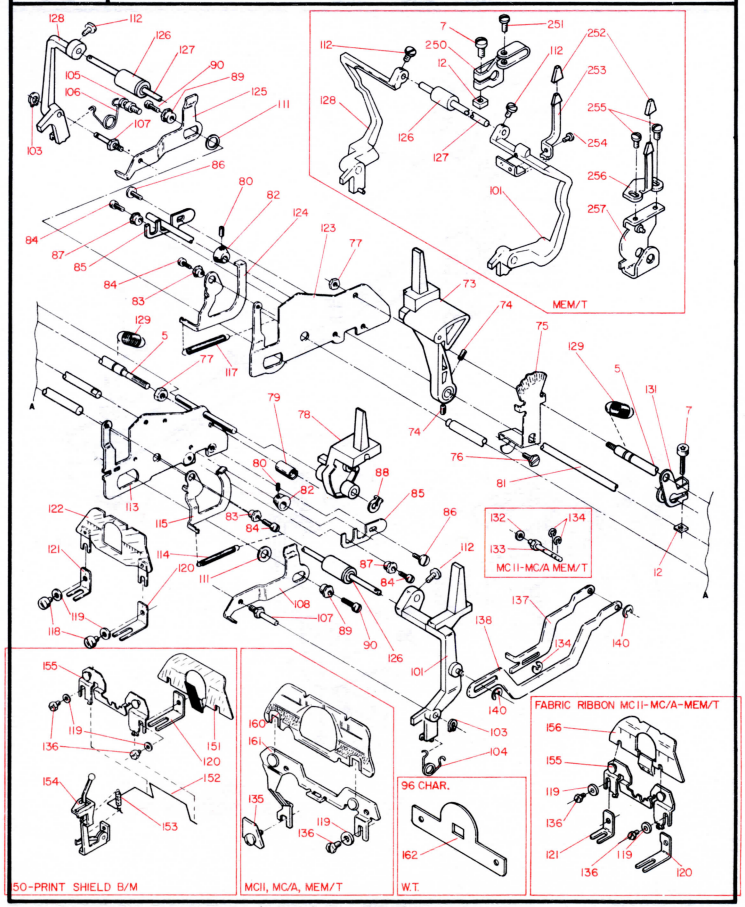
MECH. CODE **26**

PAPER FEED



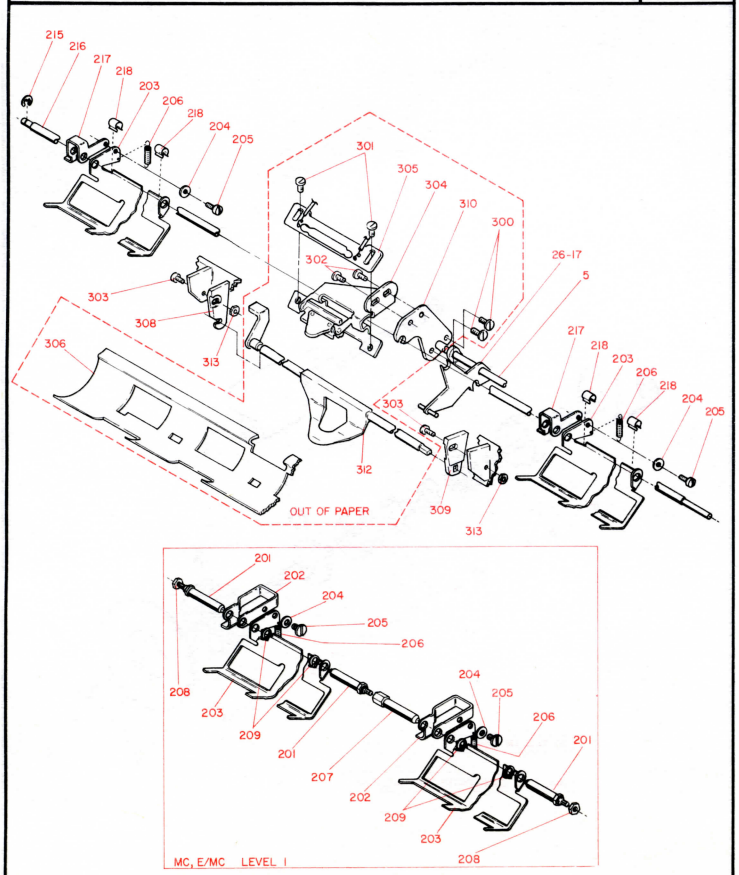
MECH. CODE **26**

PAPER FEED



PAPER FEED

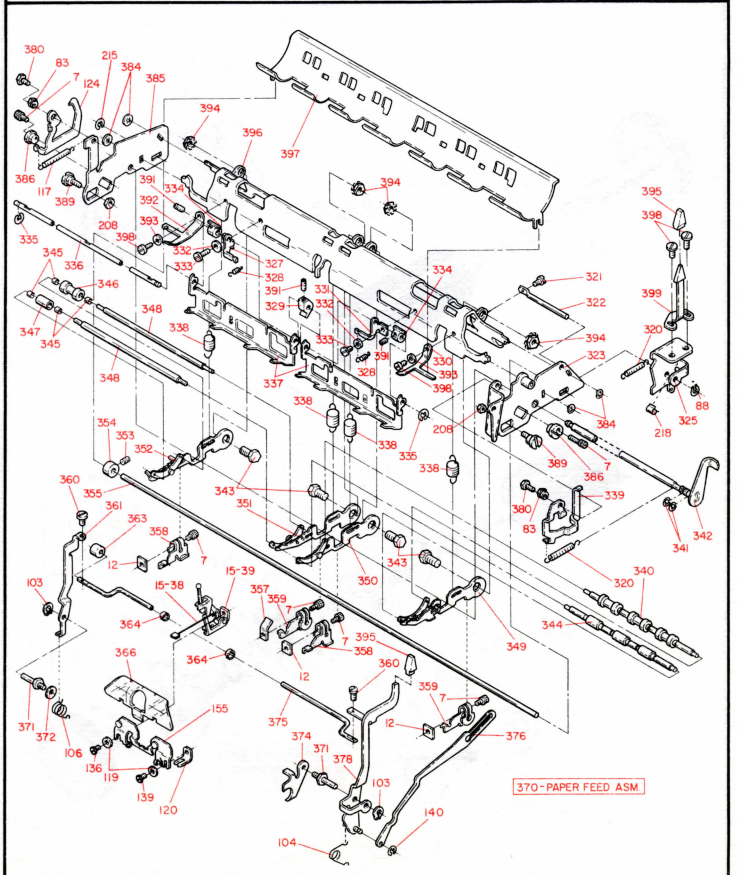
MECH. CODE 26



PAPER FEED (A-FRAME)

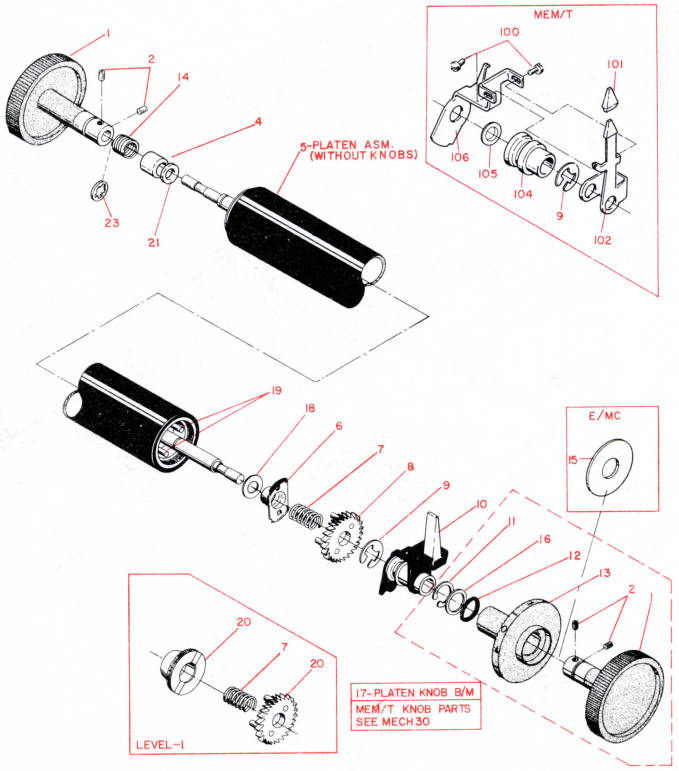
ESC – MCC

MECH. CODE 26



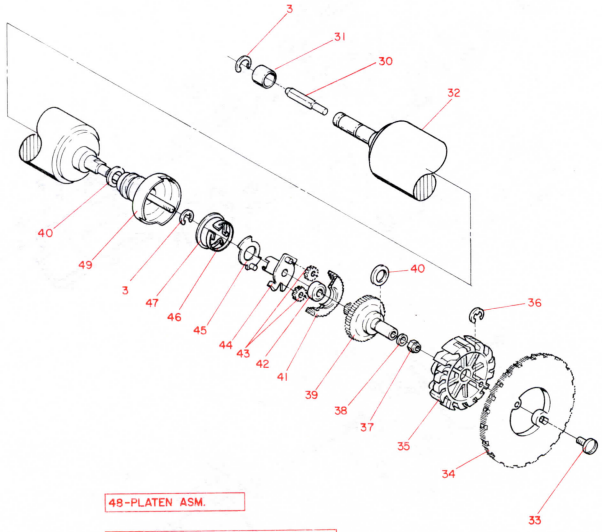
MECH. CODE **28**

PLATENS



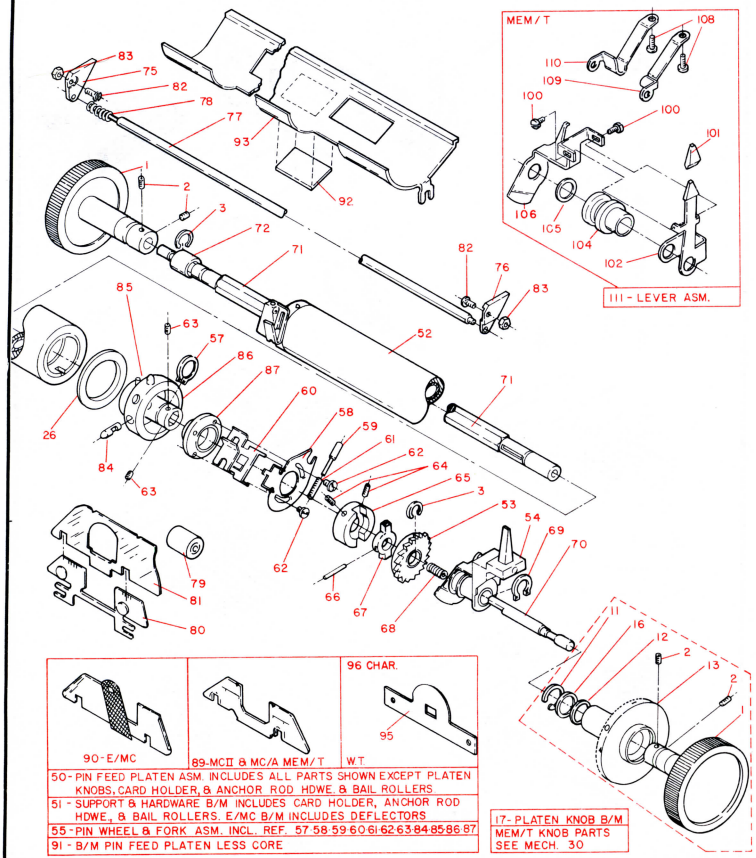
MECH. CODE **28**

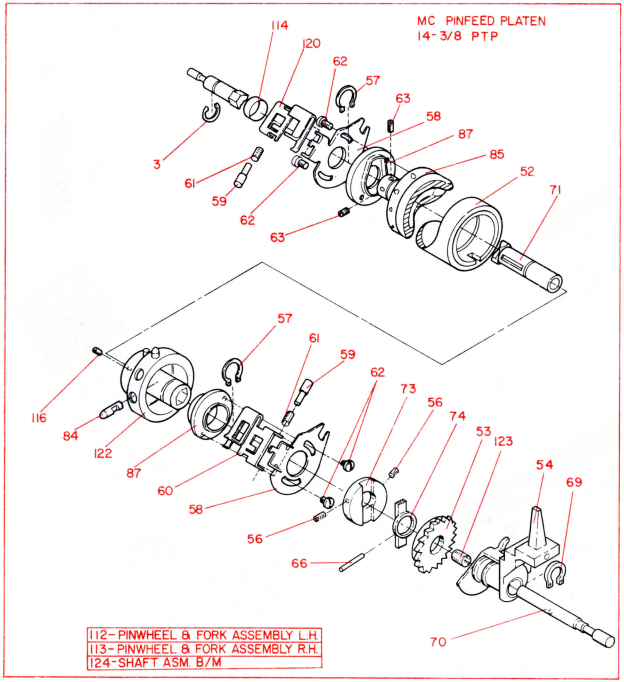
PLATENS
ESC – MCC



PIN FEED PLATENS

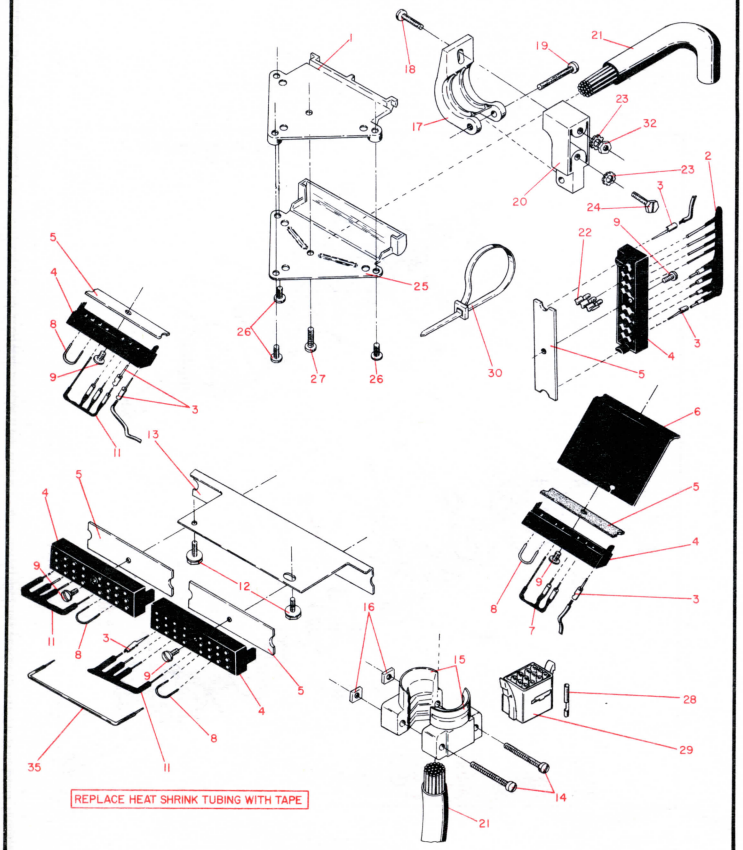
MECH. CODE 28





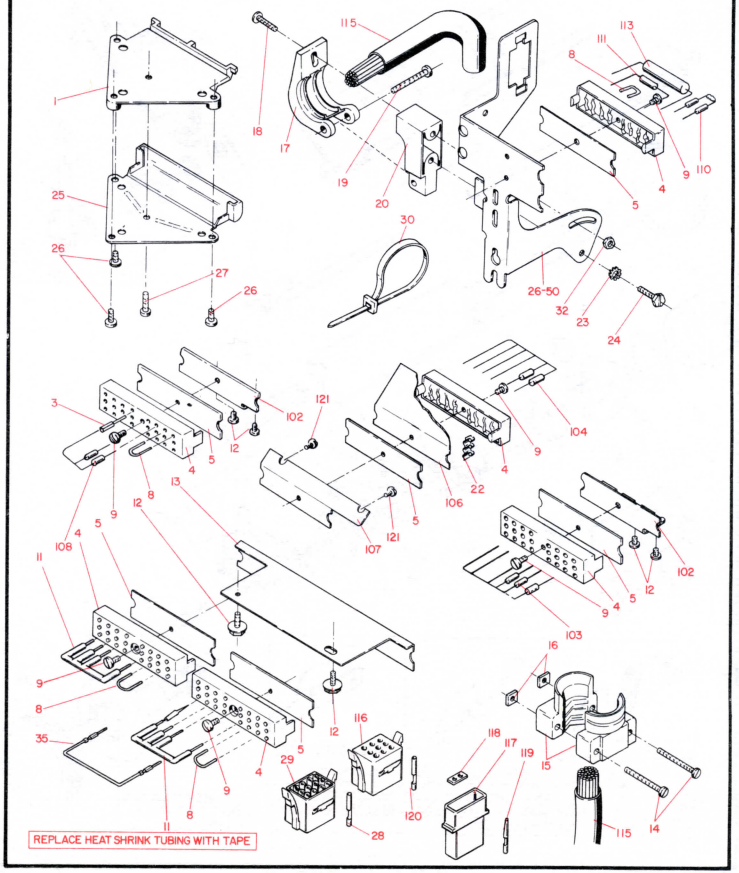
MECH. CODE **29**

CABLES & CONNECTORS
MC



MECH. CODE **29**

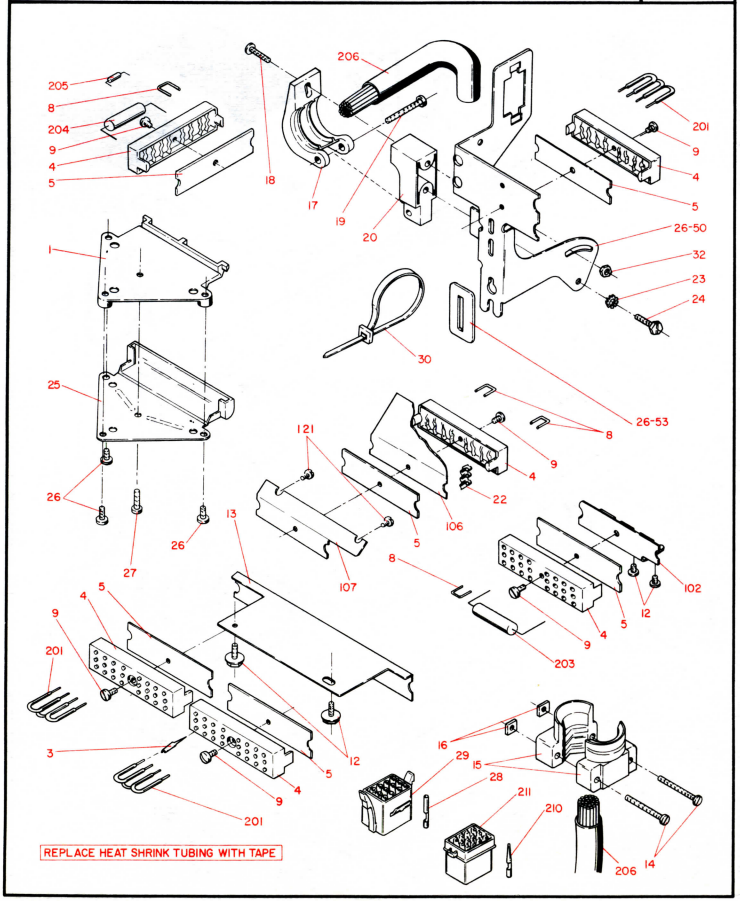
CABLES & CONNECTORS
E/MC



CABLES & CONNECTORS

MC II – MC/A

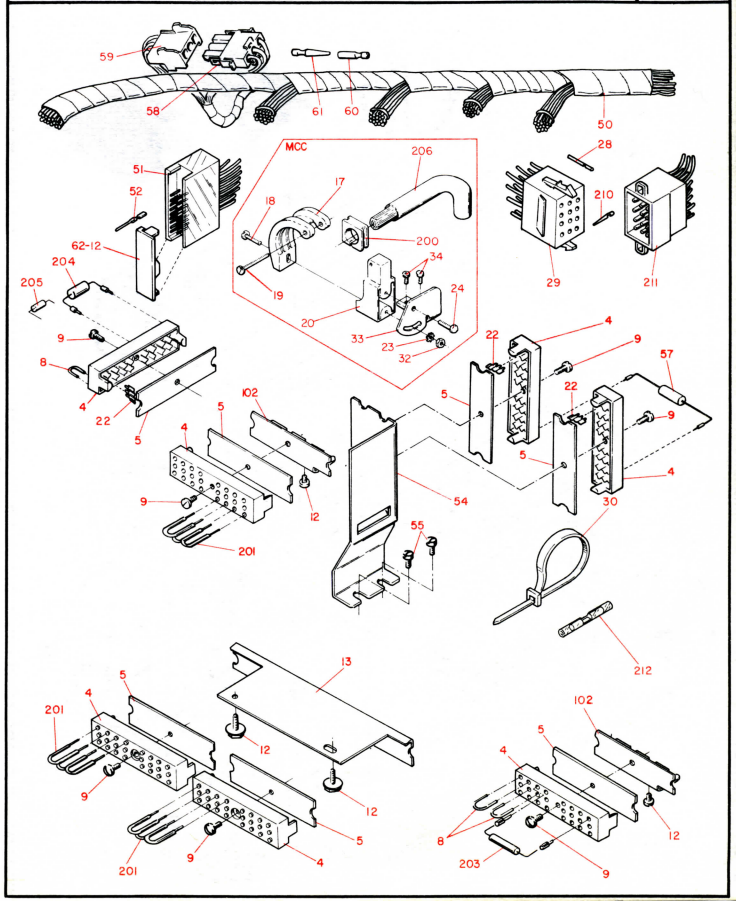
MECH. CODE 29



CABLES & CONNECTORS

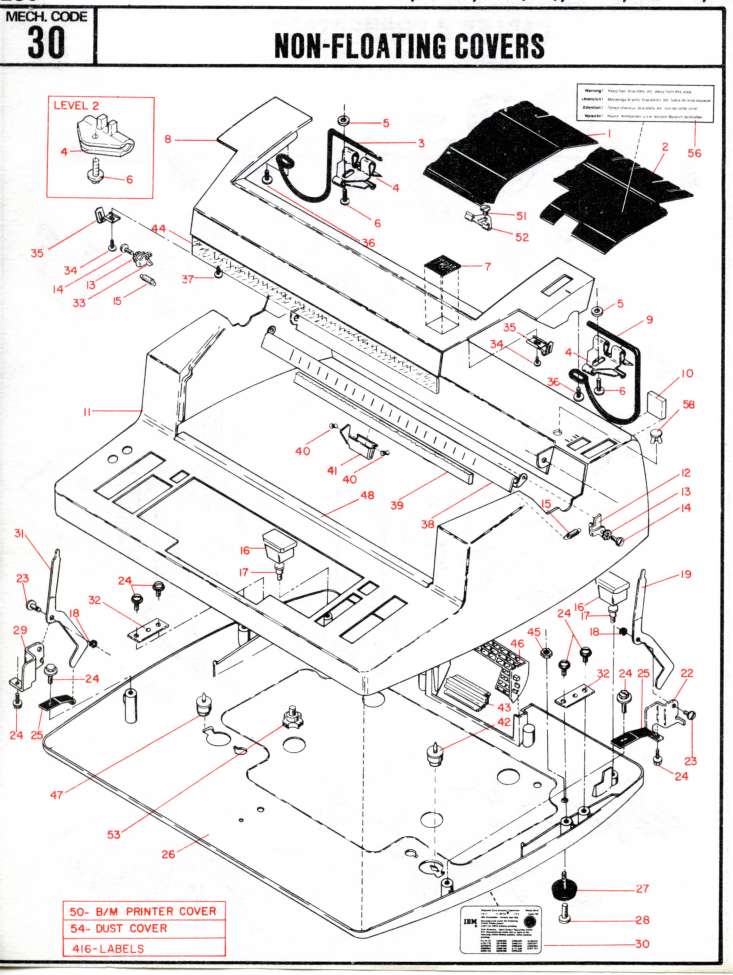
MEM/T – ESC – MCC

MECH. CODE 29



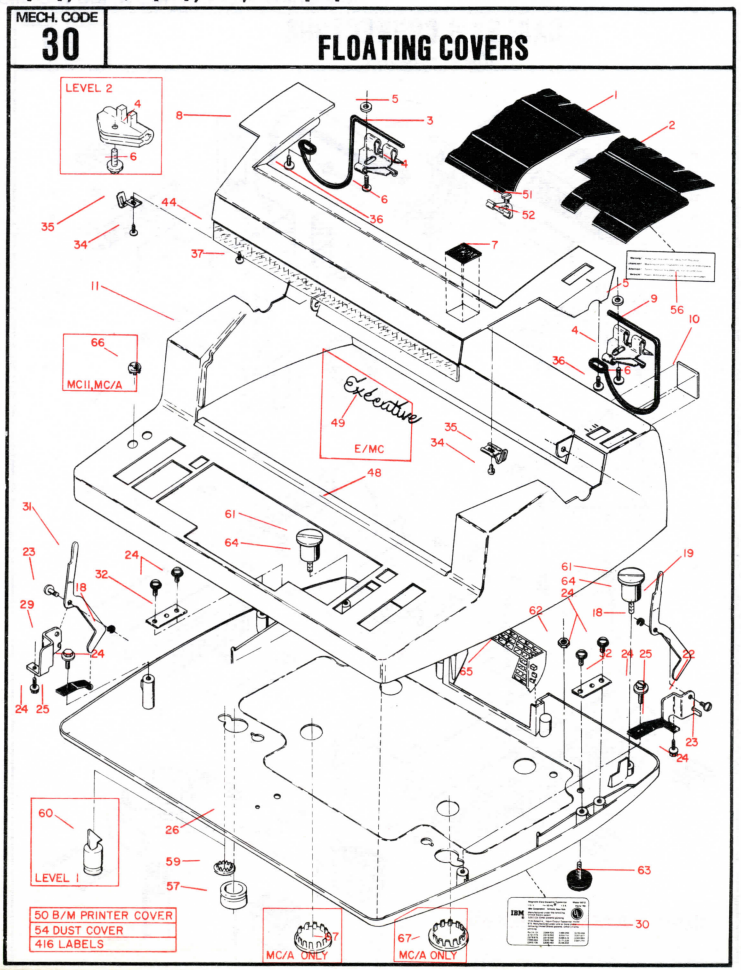
MECH. CODE 30

NON-FLOATING COVERS



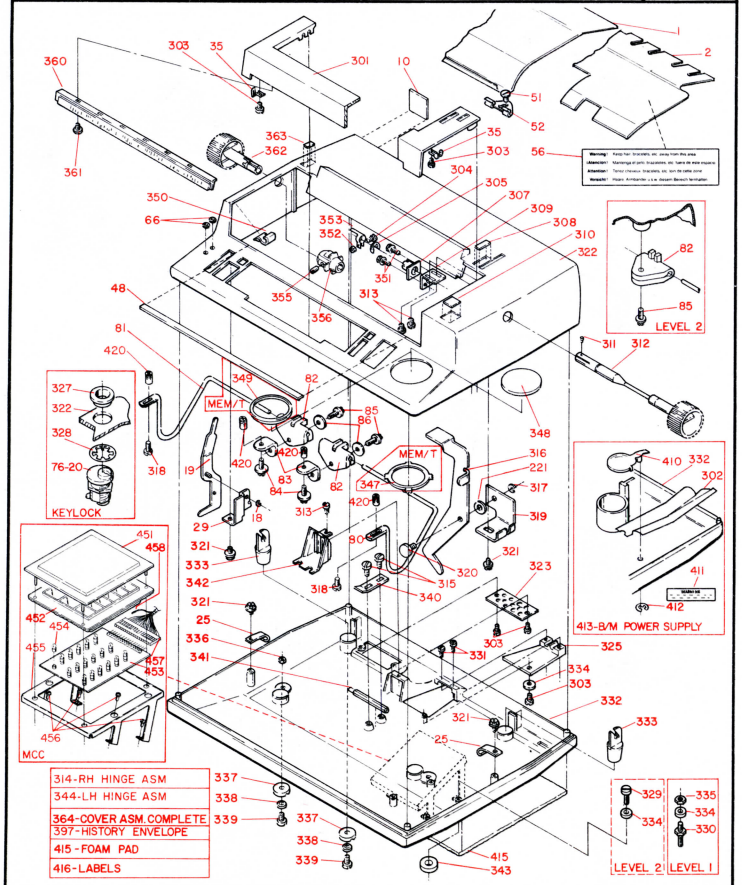
MECH. CODE 30

FLOATING COVERS



COVERS
MEM/T — ESC — MCC

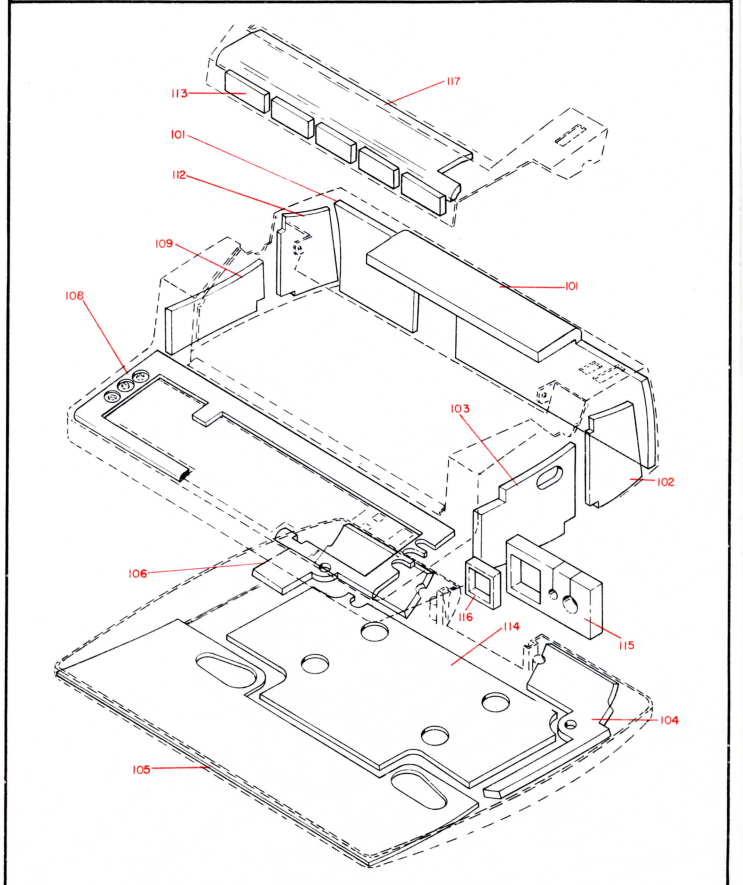
MECH. CODE 30



314-RH HINGE ASM	337
344-LH HINGE ASM	338
364-COVER ASM. COMPLETE	339
397-HISTORY ENVELOPE	
415-FOAM PAD	
416-LABELS	

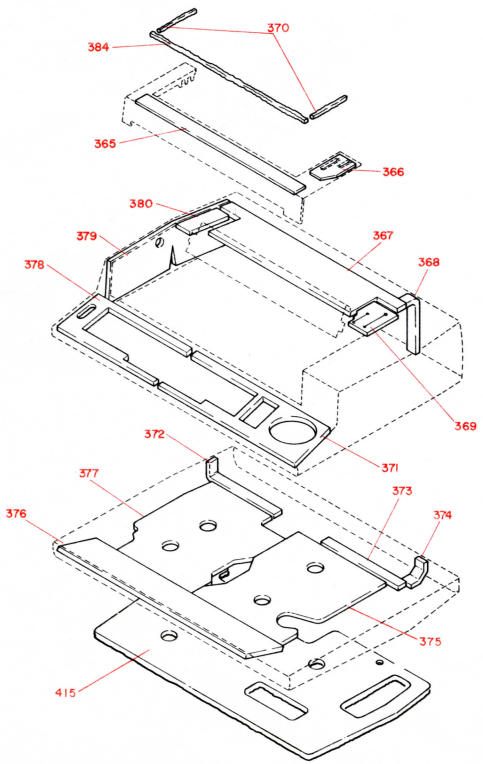
COVER INSULATION
MC — E/MC — MC II — MC/A

MECH. CODE 30



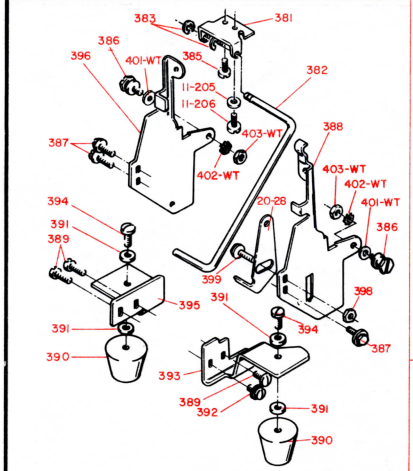
MECH. CODE **30**

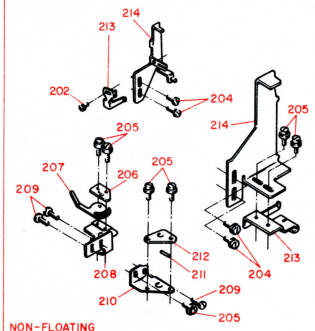
COVER INSULATION
MEM/T – ESC – MCC

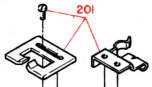


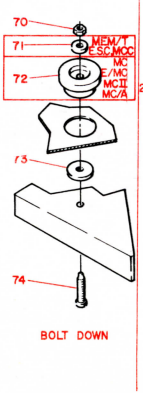
MECH. CODE **30**

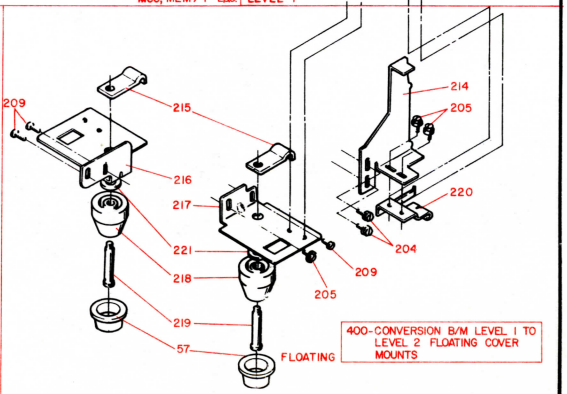
COVER MOUNTINGS







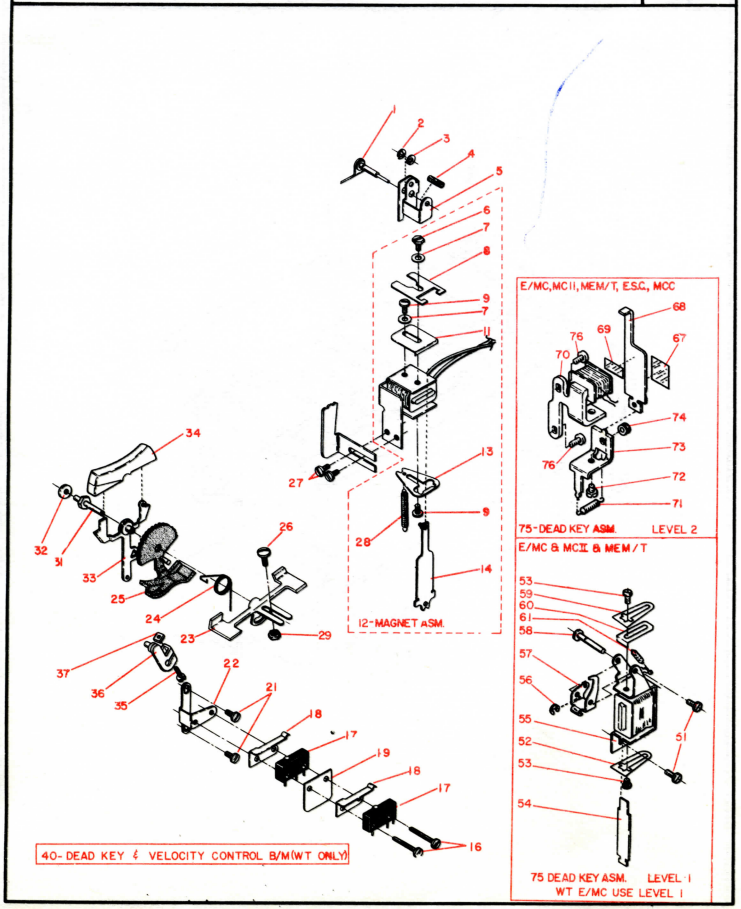




400-CONVERSION B/M LEVEL 1 TO LEVEL 2 FLOATING COVER MOUNTS

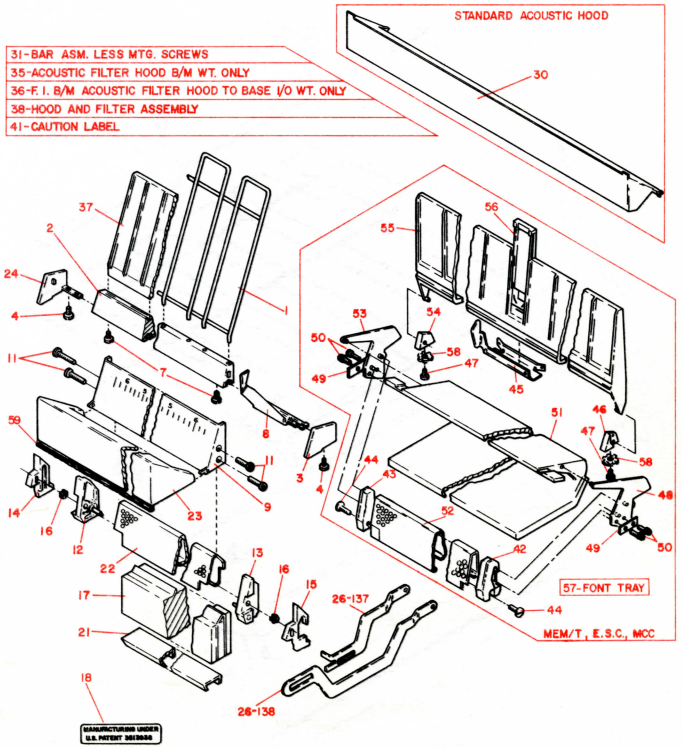
DEAD KEY & VELOCITY CONTROL

MECH. CODE 35



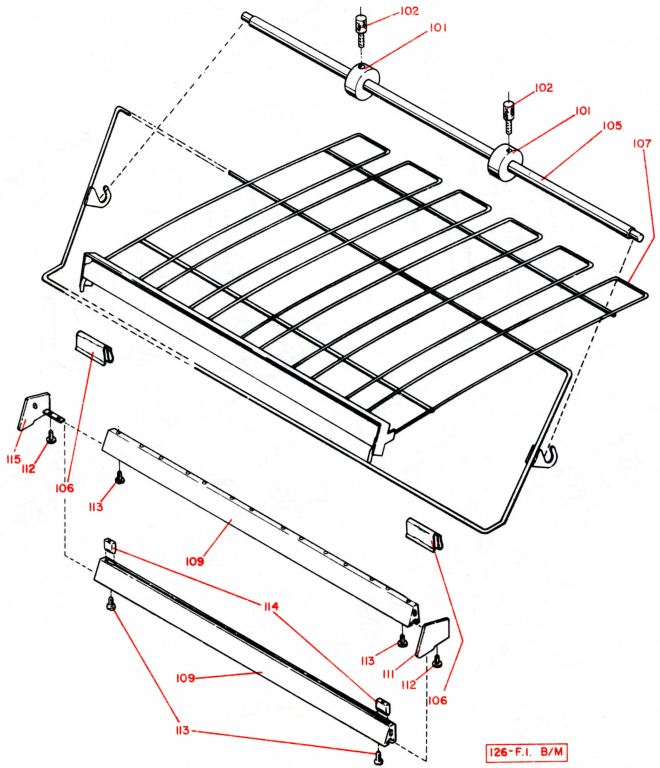
ACOUSTICAL FILTER HOOD

MECH. CODE 40



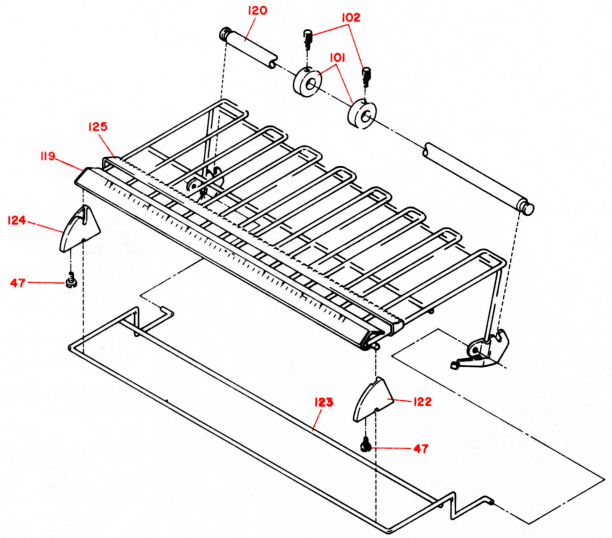
MECH. CODE **40**

ROLL PAPER HOLDER
MC – E/MC – MC II – MC/A



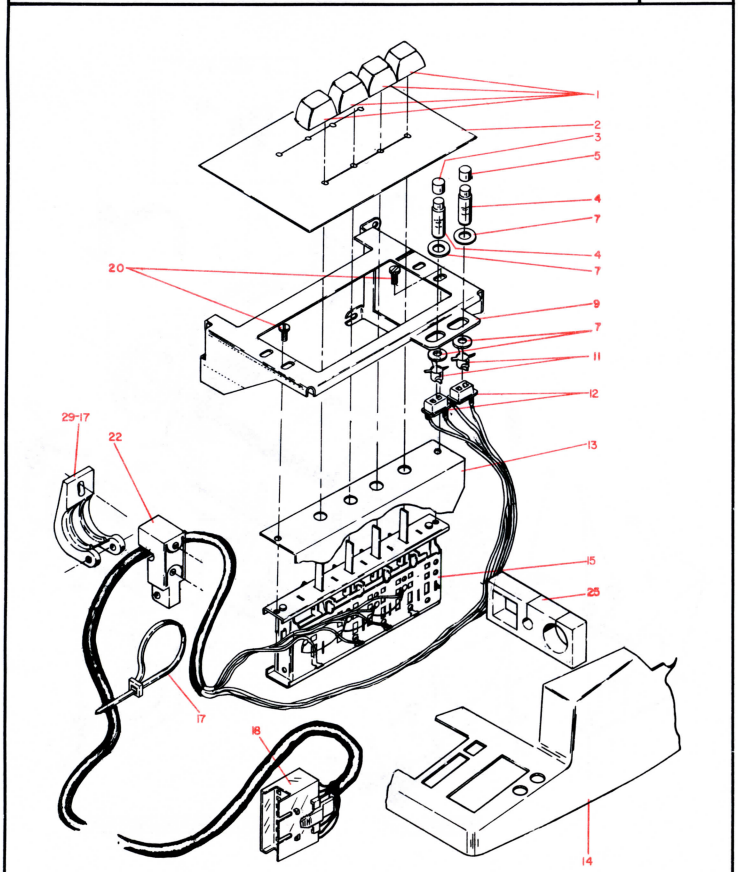
MECH. CODE **40**

ROLL PAPER HOLDER
MEM/T



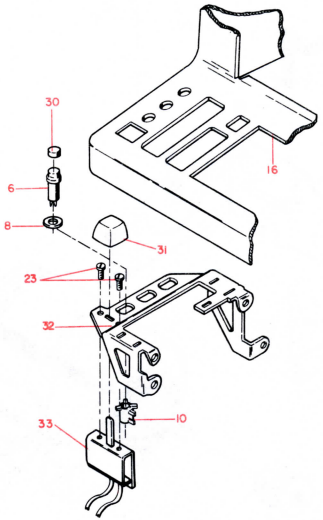
COMMUNICATING FEATURE

MECH. CODE 44



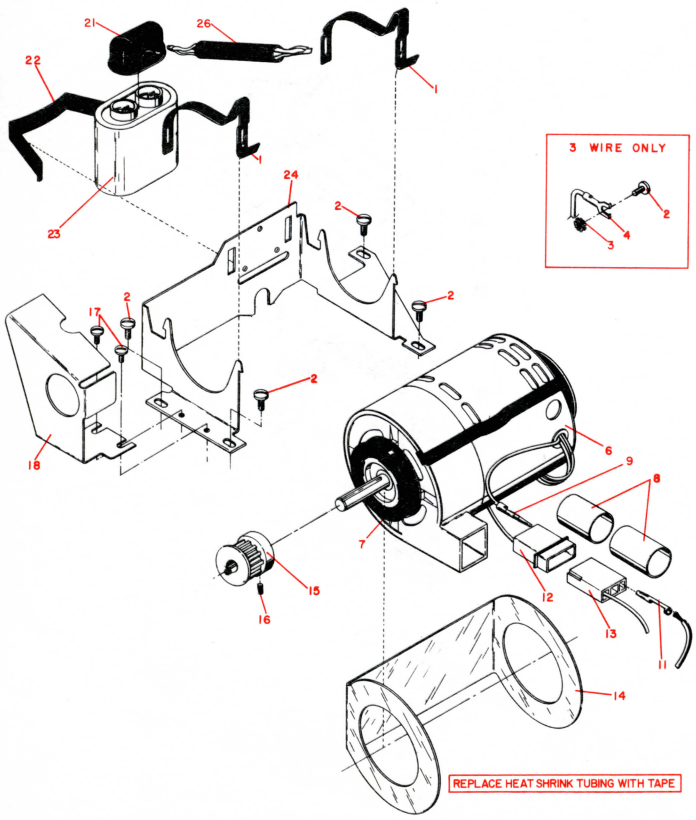
COMMUNICATING FEATURE UK & GERMANY

MECH. CODE 44



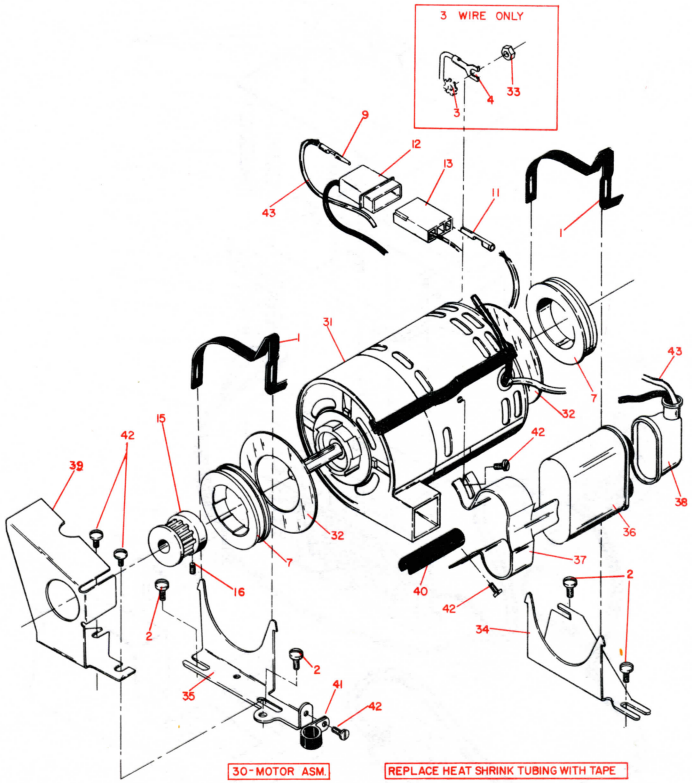
MECH. CODE **50**

MOTOR
MC (LEVEL 1)



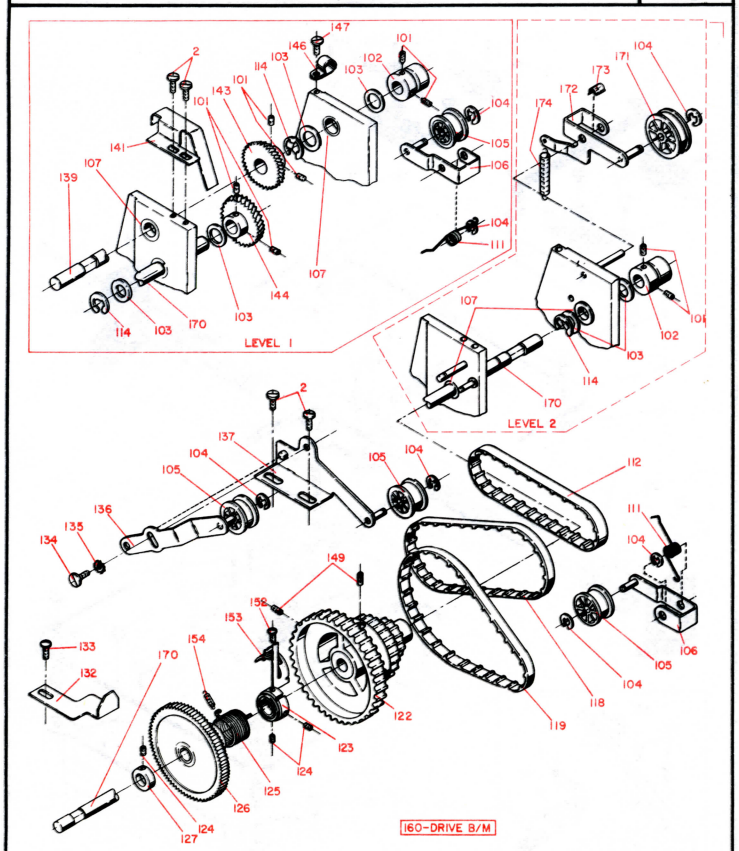
MECH. CODE **50**

MOTOR
MC (LEVEL 2) — E/MC



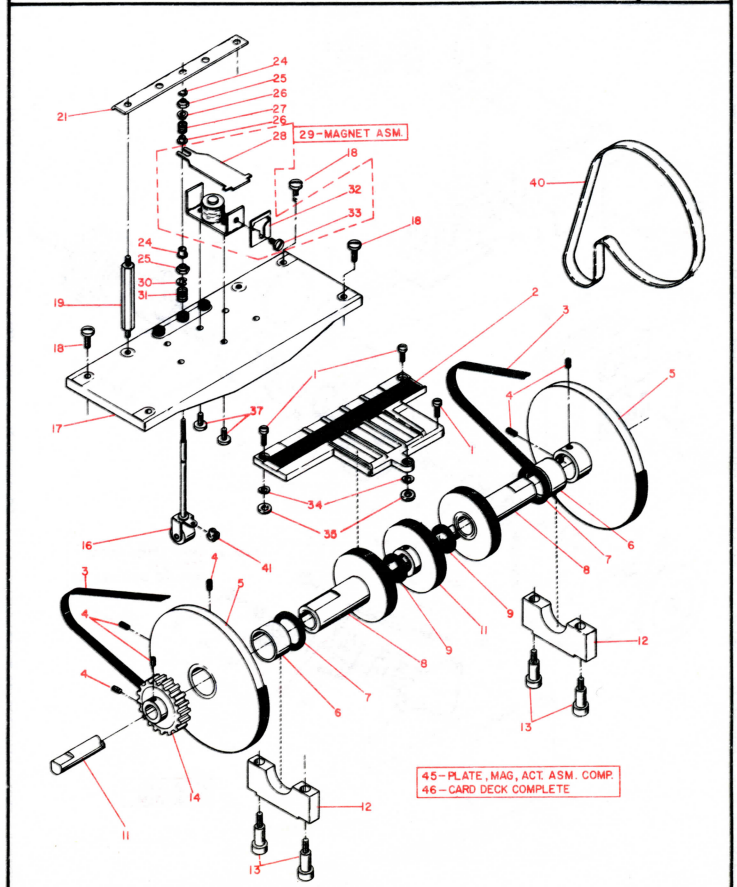
DRIVE
MC – E/MC

MECH. CODE 50



CARD DRIVE
MC – E/MC

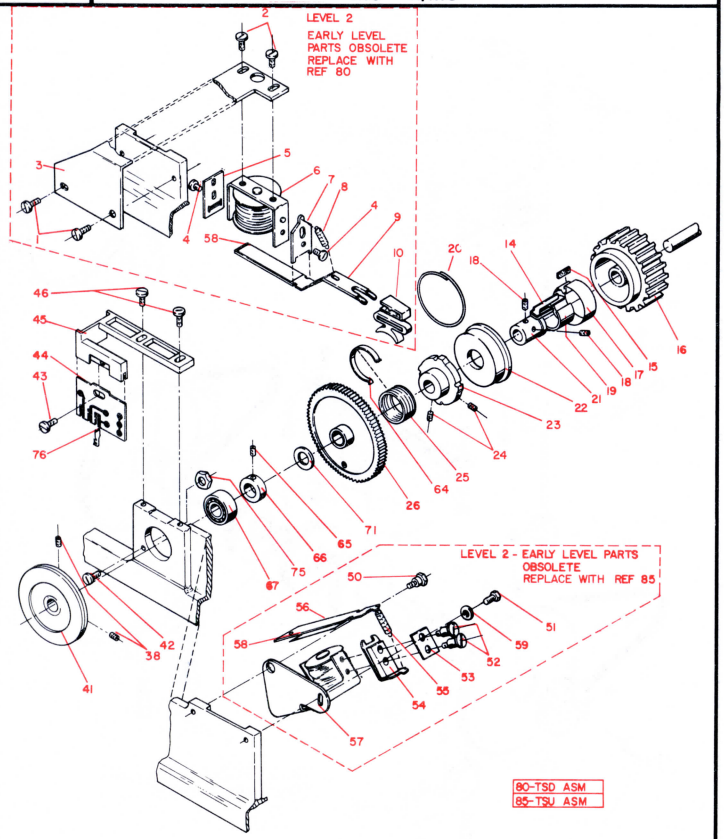
MECH. CODE 52



MECH. CODE **54**

TRACK STEP

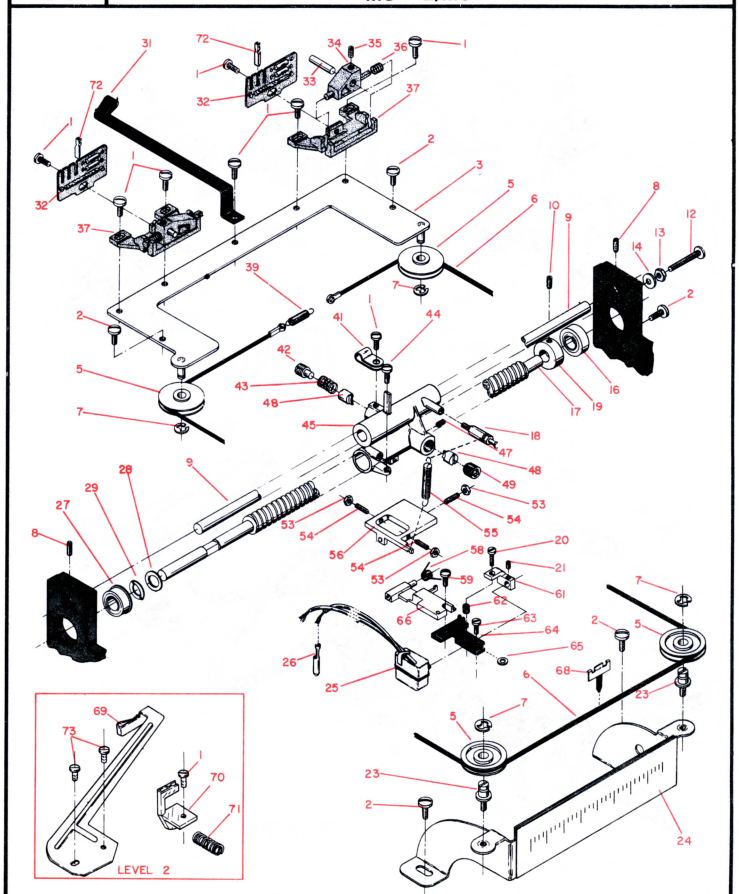
MC – E/MC



MECH. CODE **56**

HEAD & CARRIER

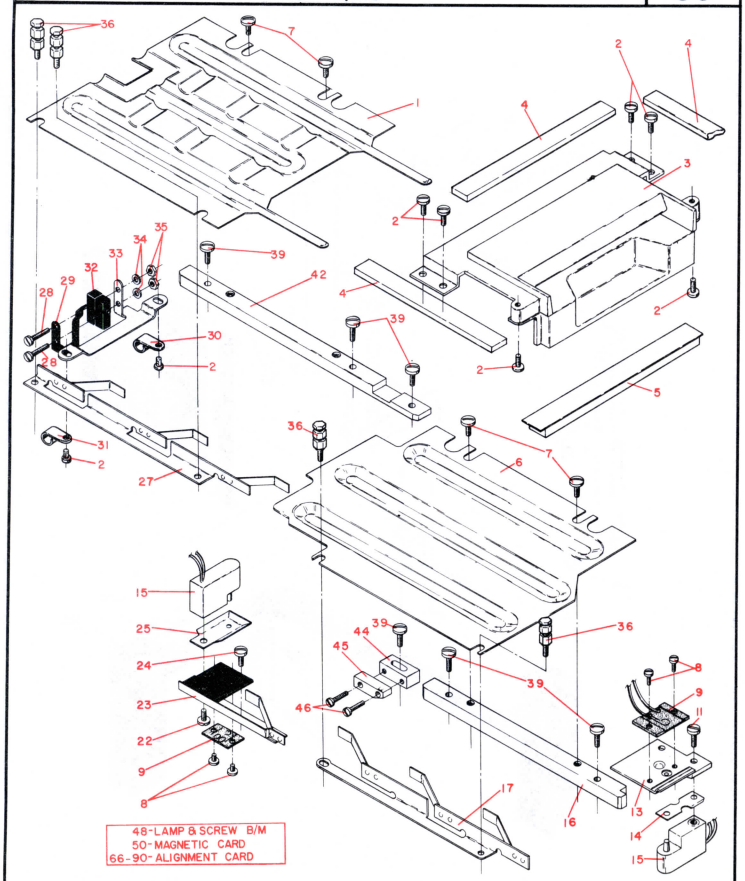
MC – E/MC



CARD PATH

MC — E/MC

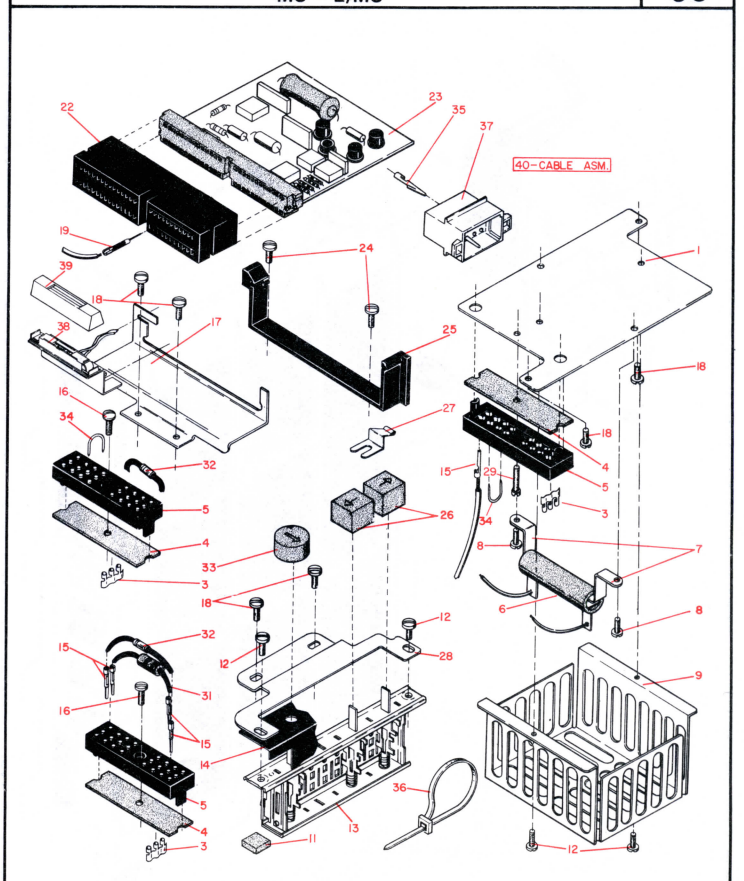
MECH. CODE 58



ELECTRICAL

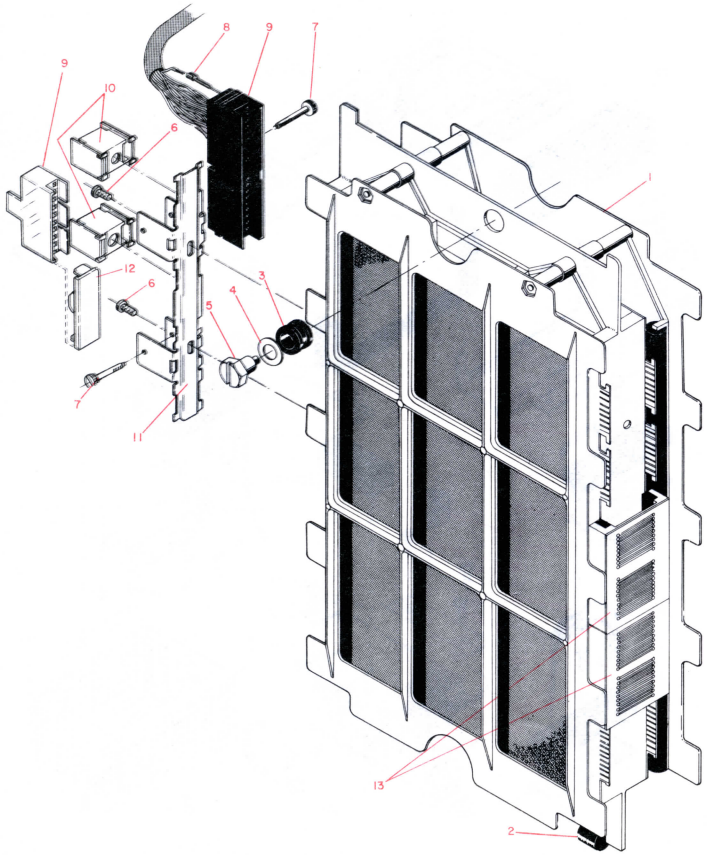
MC — E/MC

MECH. CODE 60



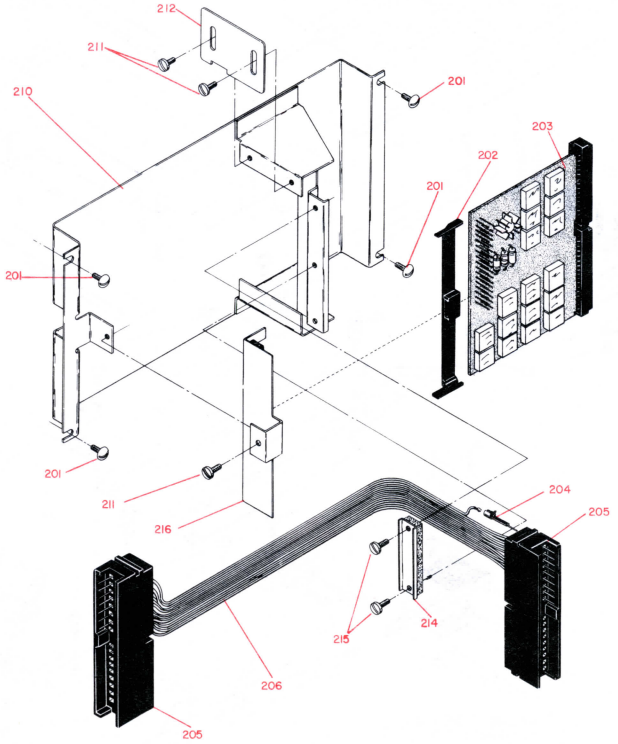
MECH. CODE **62**

PLANAR PACKAGE
MC – E/MC



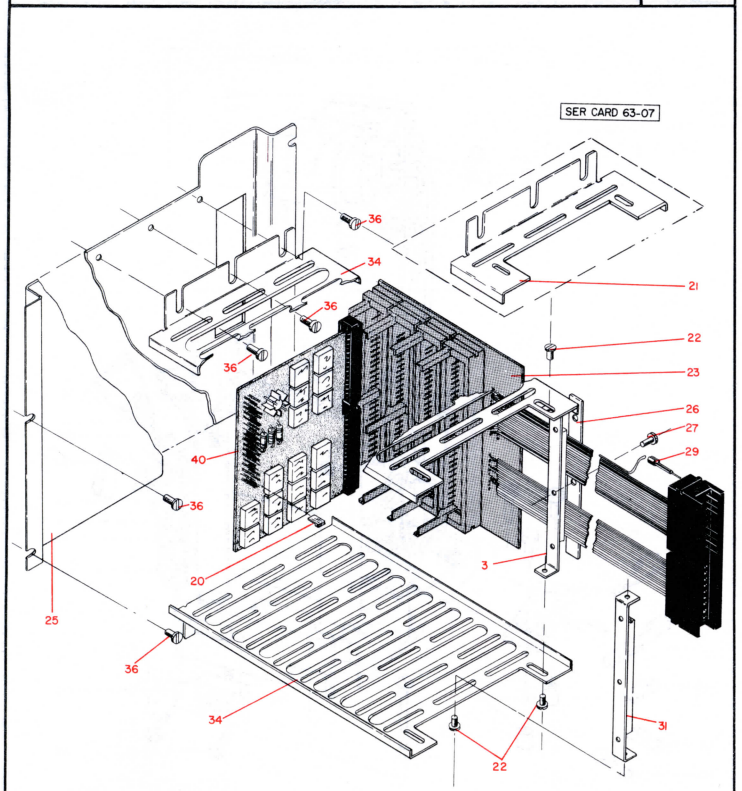
MECH. CODE **63**

SLD FEATURE CARDS
MC (LEVEL 1) (WT)



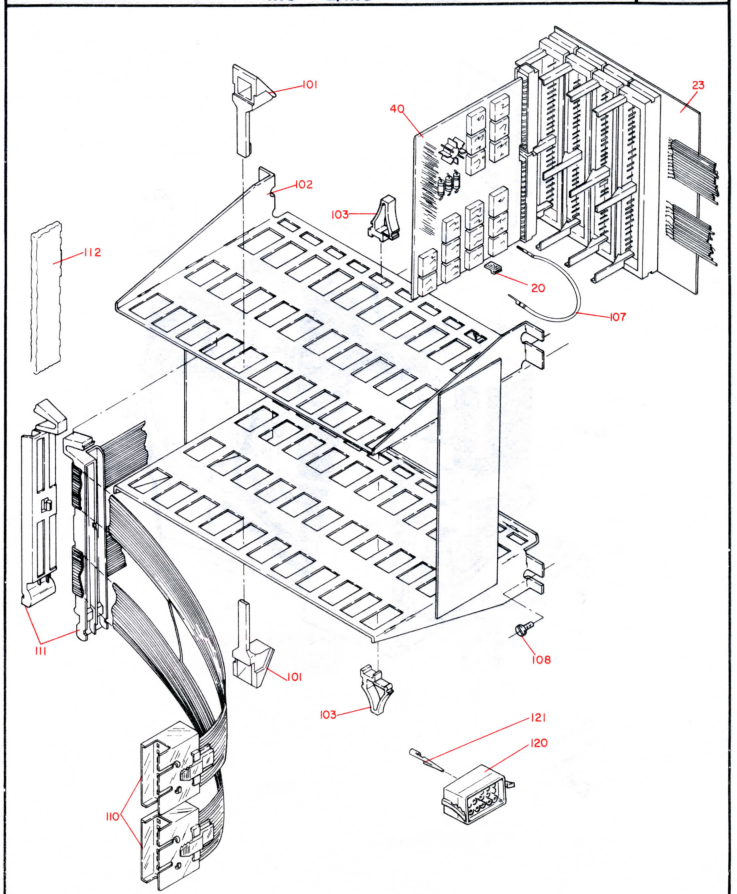
SLD FEATURE CARDS
MC

MECH. CODE 63



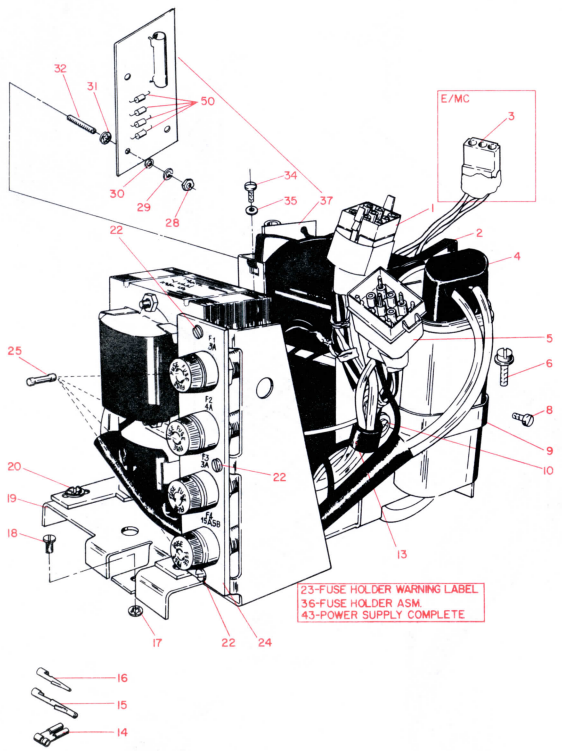
SLD FEATURE CARDS
MC — E/MC

MECH. CODE 63



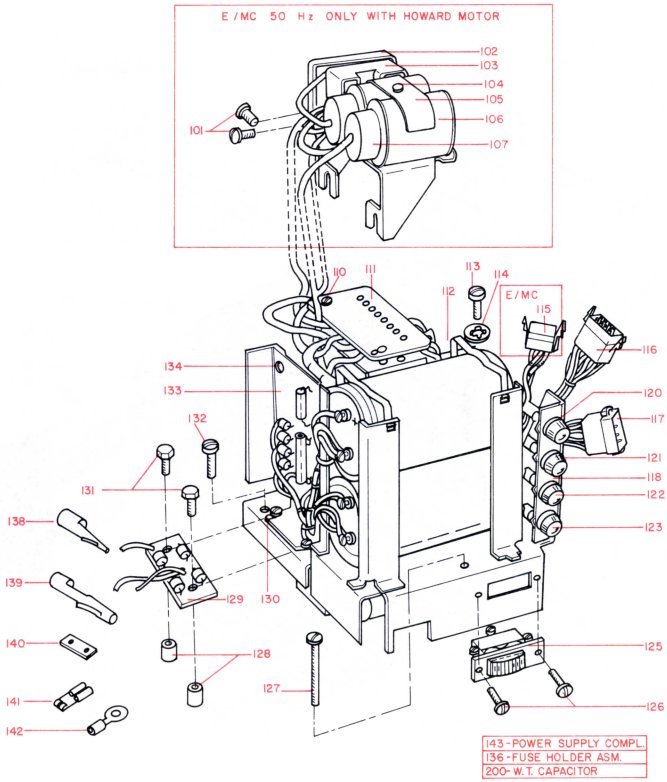
MECH. CODE **64**

POWER SUPPLY
MC – E/MC



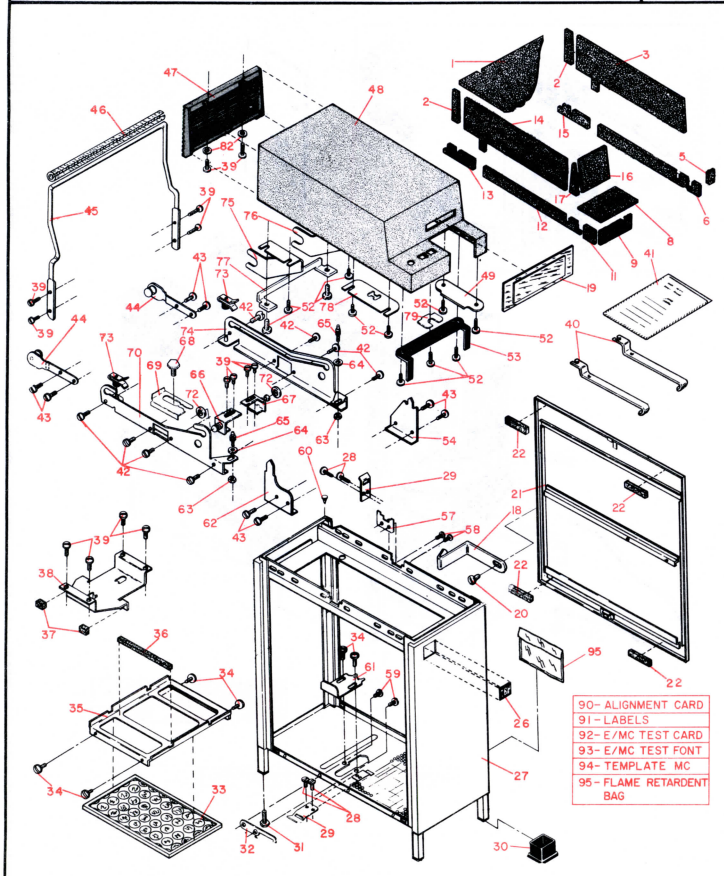
MECH. CODE **64**

POWER SUPPLY
(WT)



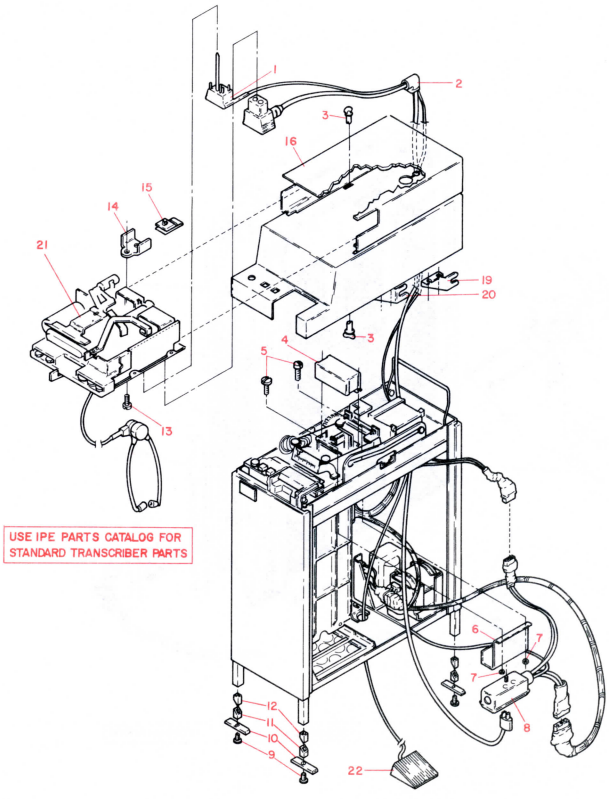
COVER & MOUNTS
MC — E/MC

MECH. CODE 66



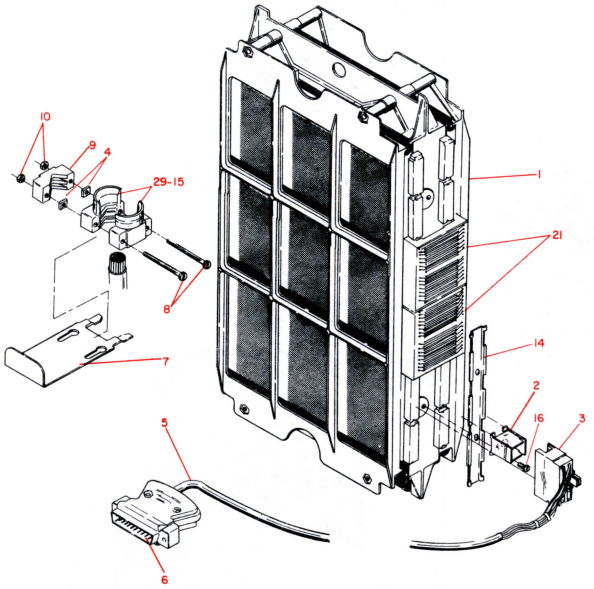
TRANSCRIBING UNIT
MC

MECH. CODE 67



MECH. CODE 72

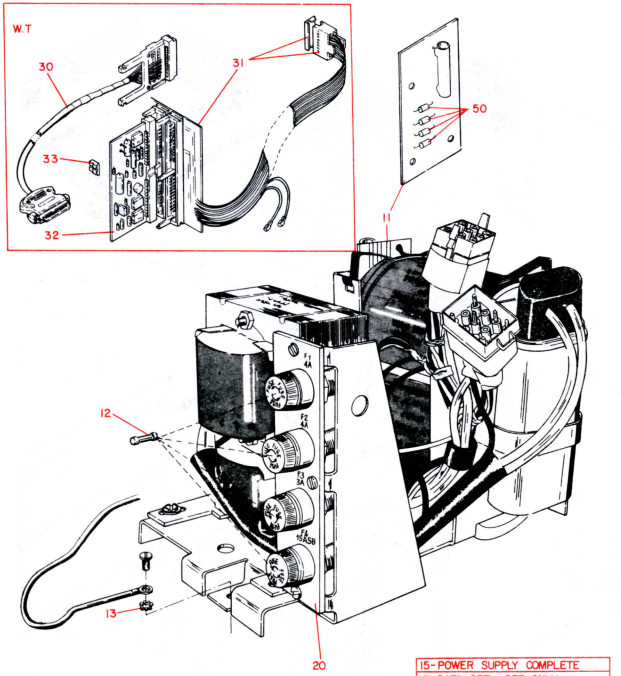
COMMUNICATING FEATURE
MC



SEE MECH. 29 FOR UNREF OR COMMON PARTS

MECH. CODE 72

COMMUNICATING FEATURE
MC

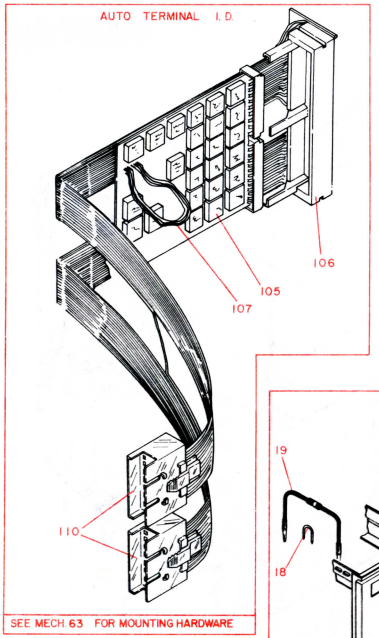


15-POWER SUPPLY COMPLETE
17-DATA SET, REF. ONLY
18-REMOTE LOCATION, REF. ONLY

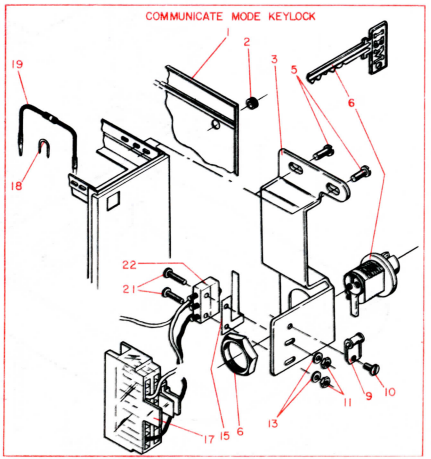
SEE MECH. 64 FOR UNREF OR COMMON PARTS

AUTO ID & KEYLOCK

MECH. CODE 74

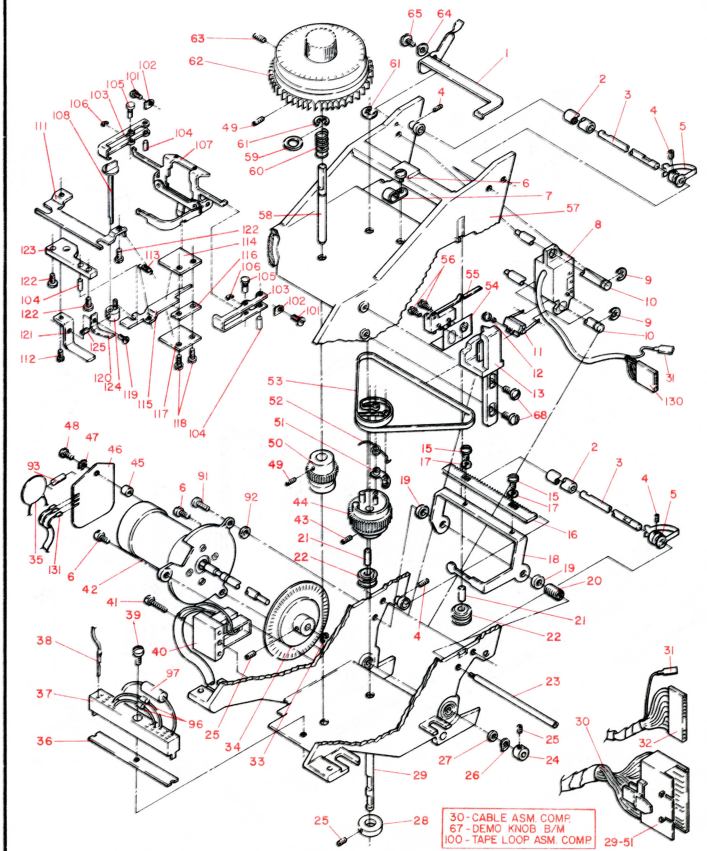


SEE MECH 63 FOR MOUNTING HARDWARE



TAPE LOOP
MEM/T

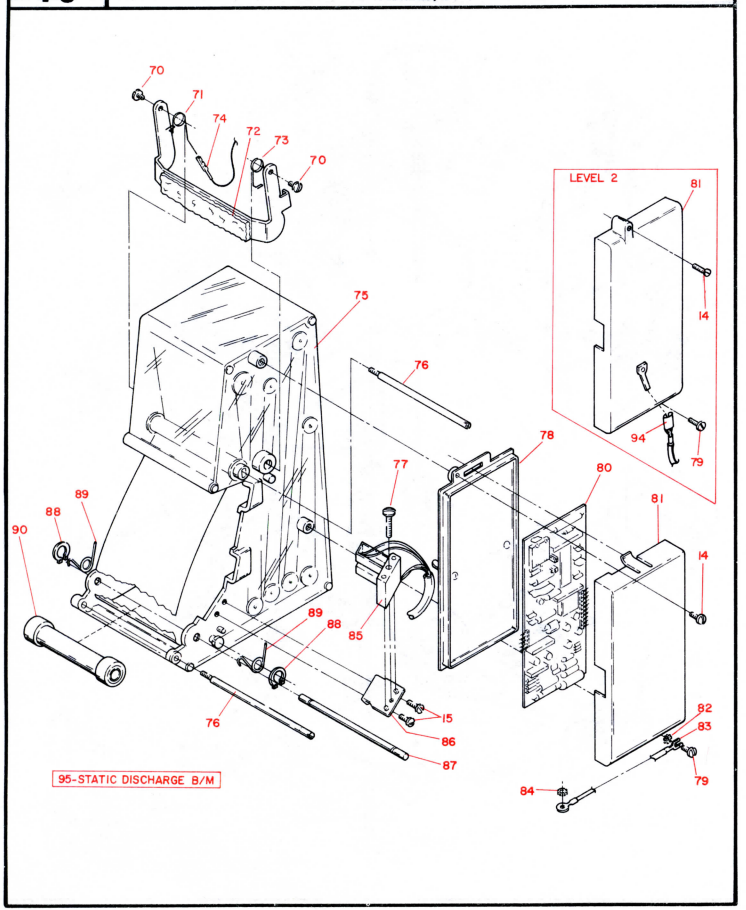
MECH. CODE 75



30 - CABLE ASM. COMP.
67 - DEMO KNOB B/M
100 - TAPE LOOP ASM. COMP.

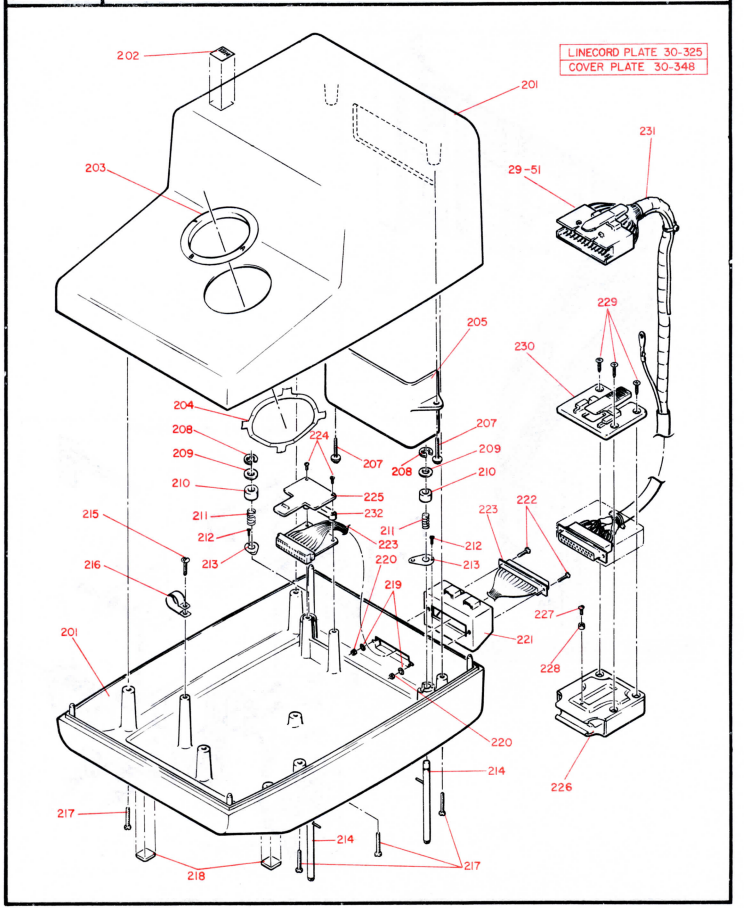
MECH. CODE **75**

TAPE LOOP
MEM/T



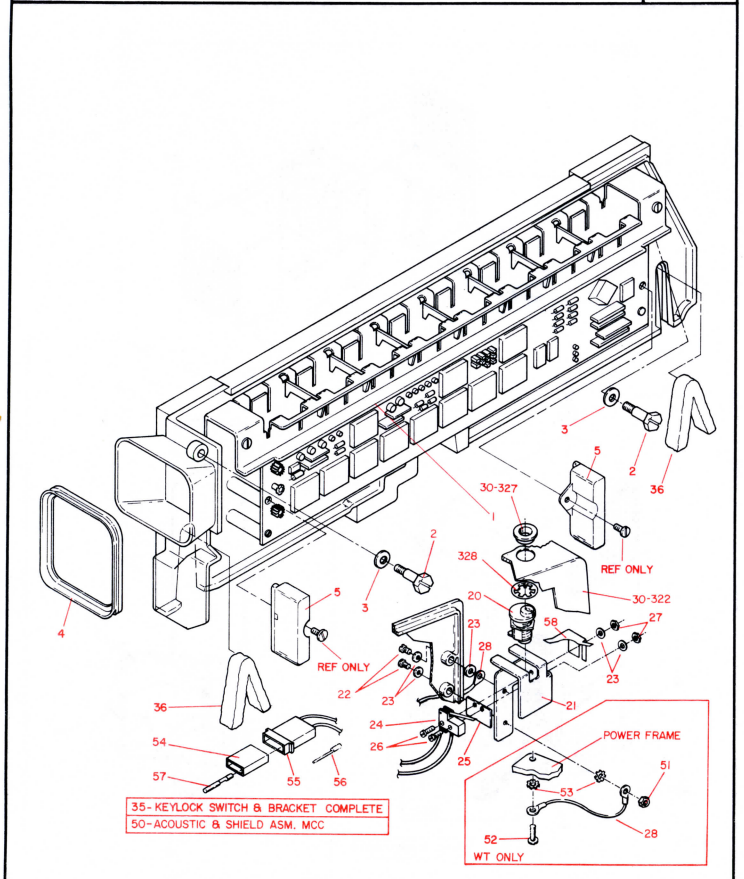
MECH. CODE **75**

EXTERNAL TAPE LOOP
MEM/T



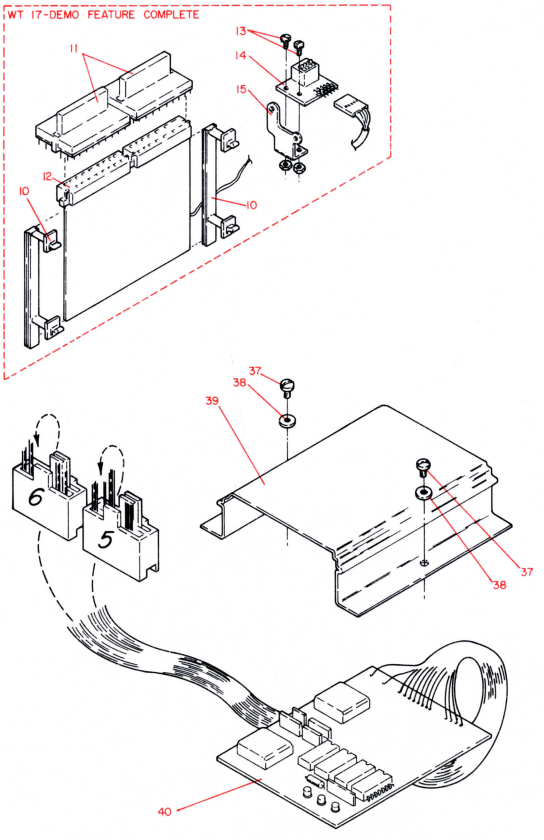
PLANAR PACKAGE
MEM/T–ESC

MECH. CODE 76



PLANAR PACKAGE
MEM/T–ESC (WT)

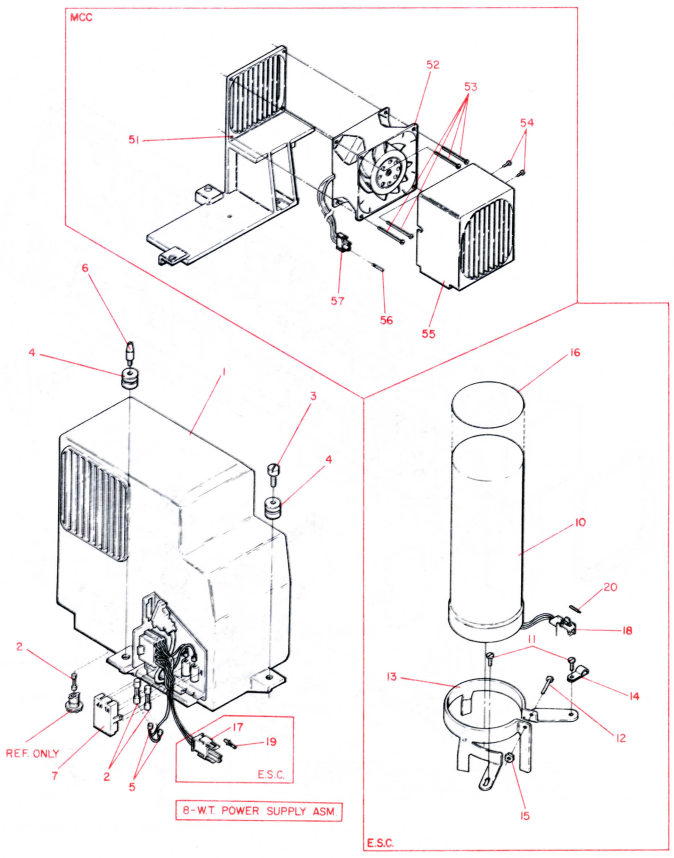
MECH. CODE 76



MECH. CODE

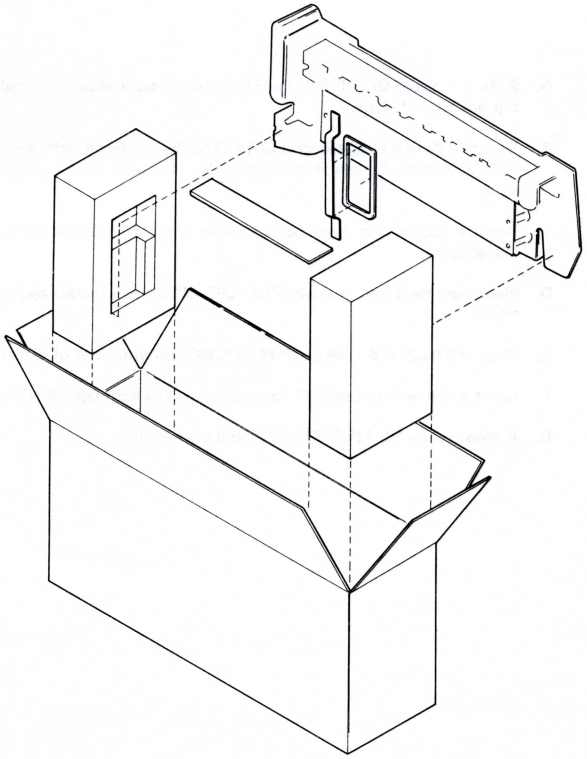
MECH. CODE
77

POWER SUPPLY
MEM/T – ESC – MCC



PLANAR PACKAGE PACKING
MC – E/MC – MC II – MC/A – MCC

MECH. CODE 80



PLANAR PACKING INSTRUCTIONS
MC – E/MC – MC II – MC/A – MCC

MECH. CODE 80

A. Remove planar assembly from box. Do not destroy foam cushions.

B. Remove return shipping label and PRCT (P/N 7395541).

C. Place old planar assembly into foam end cushions. Place one saddle cushion into bottom of box.

D. Insert planar and cushions into box. Replace top saddle cushion.

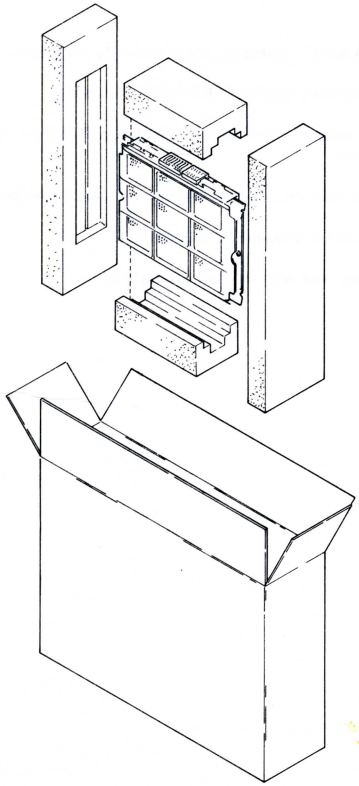
E. Tape carton closed using tape (P/N 9900502).

F. Cover old shipping label with return shipping label.

MECH. CODE 80

PLANAR PACKAGE PACKING

MEM/T — ESC



MECH. CODE 80

PACKING INSTRUCTIONS

MEM/T — ESC

A. Slide corrugated strip (P/N 3795471) between plastic clips and metal bar on top side edge of planar.

B. Tape middle of corrugated strip to metal bar by running 4 inch piece of tape (P/N 7395702) through slots in metal bar and over middle of corrugated strip.

C. Remove rubber ring from bell of planar and tape between stiffener and planar board.

D. Place right-hand end cushion (P/N 7395468) on bell shaped end of planar board.

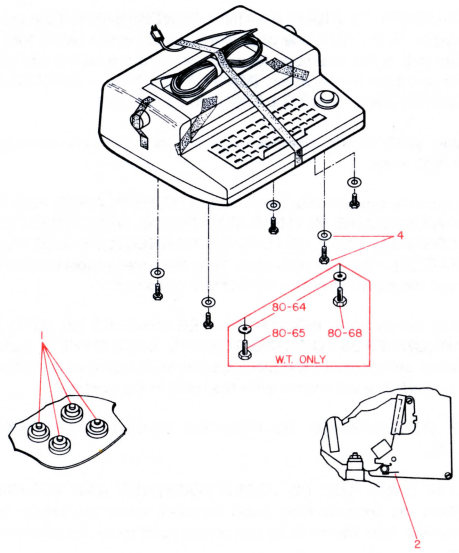
E. Place left-hand end cushion (P/N 7395469) on other end of planar board.

F. Insert assembly into box (P/N 7395466) and close with tape (P/N 7348057).

G. Address return label (P/N 7395059) and place on box.

PREPACKING
MEM/T — ESC

MECH. CODE 80



50	HARDWARE PACK B/M
73	B/M PRINTER PACKING, W.T.

PREPACKING INSTRUCTIONS
MEM/T — ESC

MECH. CODE 80

A. REMOVE RIBBON. REMOVE ELEMENT. Tilt printer up in covers and place spacers [1] in shipping hole wells.

B. Tape turning wheel extension to steel detent plate in bottom cover.

C. MEM/T—Disconnect tape loop springs [2] on each side of the tape cartridge.

D. DISENGAGE PLATEN KNOBS FROM PLATEN AND REINSERT INTO THE COVER. USE A STRIP OF TAPE ON EACH KNOB TO SECURE IT TO THE COVER.

E. Lower printer, replace and latch cover.

F. Power on, move carrier to extreme right, power off. Loop tape around tab on left end of ribbon feed plate and tape to the cover.

G. Tape top cover, acoustic filter and acoustic cover to the center cover on both sides. Tape paper support in the down position.

H. Tilt unit on its back. SECURE POWER FRAME AND POWER SUPPLY TO BOTTOM COVER WITH SLOTTED HEX BOLTS AND WASHERS [4].

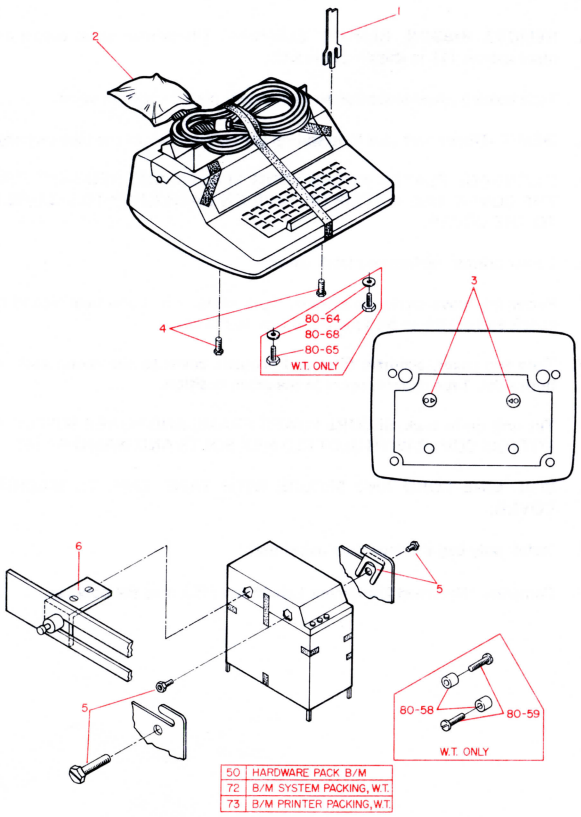
I. COIL LINE CORD AND SECURE WITH TAPE. TAPE TO MACHINE COVER.

J. Install poly bag and tape poly bag closed.

K. Complete "Returned Equipment Label" and affix it to the polybag.

MECH. CODE **80**

PREPACKING
MC – E/MC



50	HARDWARE PACK B/M
72	B/M SYSTEM PACKING, W.T.
73	B/M PRINTER PACKING, W.T.

MECH. CODE **80**

PREPACKING INSTRUCTIONS
MC – E/MC

A. REMOVE RIBBON. REMOVE ELEMENT. REMOVE PLATEN KNOBS. INSURE PRINTER COVER IS LATCHED.

B. MOVE CARRIER TO RIGHT AGAINST POWERFRAME. Turn power off. Secure carrier to the right side of powerframe using the carrier lock [1]. If the carrier lock is not available, loop tape around tab on left end of ribbon feed plate and tape to the cover. (MAG CARD ONLY – MANUALLY ROTATE TAB TORQUE BAR TO LATCH OUT PAWLS.)

C. Move paper guide to left. Remove paper support. Tape top cover to center cover on both sides.

D. Remove console top and side cover. MAKE SURE PLANAR AND POWER SUPPLY ARE SECURE IN THEIR MOUNTINGS. DISCONNECT CABLES FROM CONSOLE. SNAP COVERS ON CONNECTORS AND PLACE IN JIFFY BAG [2]. Seal bag with tape. Tape the paper support to the console cover. Tape the platen knobs to the bottom of console.

E. Tilt printer on its back. INSERT PRINTER SPACERS [3] INTO HOLES WITH ARROWHEADS POINTING TOWARD EACH OTHER. Hold spacer flange firmly against cover and move spacers in direction of arrowhead until holes in powerframe are aligned with the holes in the spacers.

F. SECURE POWERFRAME TO PRINTER COVER WITH HEX HEAD BOLTS [4].

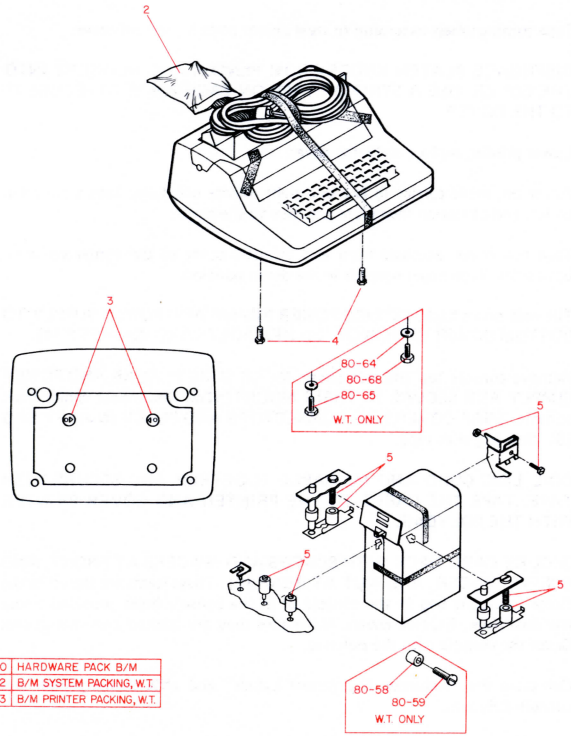
G. COIL LINE CORD AND I/O CABLE TOGETHER AND SECURE WITH TAPE. With the acoustic filter hood installed, cover the printer with the dust cover and tape the cable to the printer, and cover the printer with the poly bag.

H. SECURE CARD DECK WITH SCREWS AND SPACERS [5] AT FRONT. LOOSEN REAR PIVOT BRACKETS, MOVE TO OUTER LIMITS AND RETIGHTEN [6]. REPLACE COVERS. Make sure they are latched, and tape closed. Cover the console with the polybag.

I. Complete the "Returned Equipment Labels" and affix to the printer and console polybags.

PREPACKING
MC II – MC/A

MECH. CODE 80



50	HARDWARE PACK B/M
72	B/M SYSTEM PACKING, W.T.
73	B/M PRINTER PACKING, W.T.

PREPACKING INSTRUCTIONS
MC II – MC/A

MECH. CODE 80

A. REMOVE RIBBON. REMOVE ELEMENT. REMOVE PLATEN KNOBS. INSURE PRINTER COVER IS LATCHED.

B. MOVE CARRIER TO RIGHT AGAINST POWERFRAME. Turn power off. Loop tape around tab on left end of ribbon feed plate and tape to the cover.

C. Move paper guide to left. Remove paper support. Tape top cover to center cover on both sides.

D. Remove console top and side cover. MAKE SURE PLANAR AND POWER SUPPLY ARE SECURE IN THEIR MOUNTINGS. Disconnect cables from console. SNAP COVERS ON CONNECTORS AND PLACE IN JIFFY BAG [2]. Seal bag with tape. Tape the paper support to center partition on the planar board side. Tape platen knobs to bottom of console.

E. Tilt printer on its back. INSERT PRINTER SPACERS [3] INTO HOLES WITH ARROWHEADS POINTING TOWARD EACH OTHER. Hold spacer flange firmly against cover and move spacers in direction of arrowhead until holes in powerframe are aligned with the holes in the spacers.

F. SECURE POWERFRAME TO PRINTER COVER WITH HEX HEAD BOLTS [4].

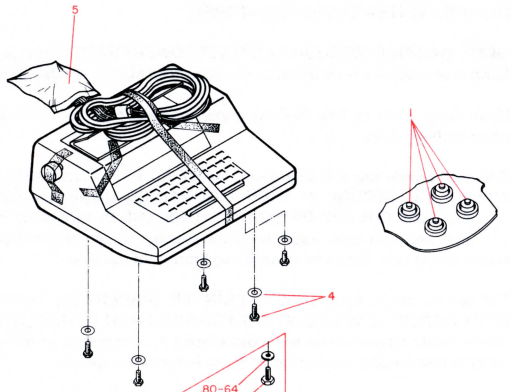
G. COIL LINE CORD AND I/O CABLE TOGETHER AND SECURE WITH TAPE. With the acoustic filter hood installed, cover the printer with the dust cover, and tape the cable to the printer, and cover the printer with the poly bag.

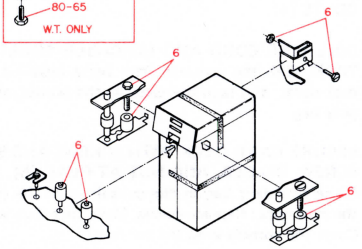
H. SECURE CARD DECK WITH SCREWS AND SPACERS AT FRONT, AND SCREW, SPACER, AND NUT AT REAR [5]. These items are stored in the flame retardant bag in the console or in the console holes provided under the card deck. Replace covers. Make sure they are latched and tape closed. Cover the console with the polybag.

I. Complete the "Returned Equipment Labels" and affix to the printer and console polybags.

MECH. CODE **80**

PREPACKING
MCC







50	HARDWARE PACK B/M
72	B/M SYSTEM PACKING, W.T.
73	B/M PRINTER PACKING, W.T.

MECH. CODE **80**

PREPACKING INSTRUCTIONS
MCC

A. REMOVE RIBBON. REMOVE ELEMENT. Tilt printer up in covers and place spacers [1] in shipping hole wells.

B. Tape turning wheel extension to steel detent plate in bottom cover.

C. DISENGAGE PLATEN KNOBS FROM PLATEN AND REINSERT INTO THE COVER. USE A STRIP OF TAPE ON EACH KNOB TO SECURE IT TO THE COVER.

D. Lower printer, replace and latch cover.

E. Power on, move carrier to extreme right, power off. Loop tape around tab on left end of ribbon feed plate and tape to the cover.

F. Tape top cover, acoustic filter and acoustic cover to the center cover on both sides. Tape paper support in the down position.

G. Tilt unit on its back. SECURE POWER FRAME AND POWER SUPPLY TO BOTTOM COVER WITH SLOTTED HEX BOLTS AND WASHERS [4].

H. Remove console top and side cover. MAKE SURE PLANAR AND POWER SUPPLY ARE SECURE IN THEIR MOUNTINGS. Disconnect cables from console. SNAP COVERS ON CONNECTORS AND PLACE IN JIFFY BAG [5]. Seal bag with tape.

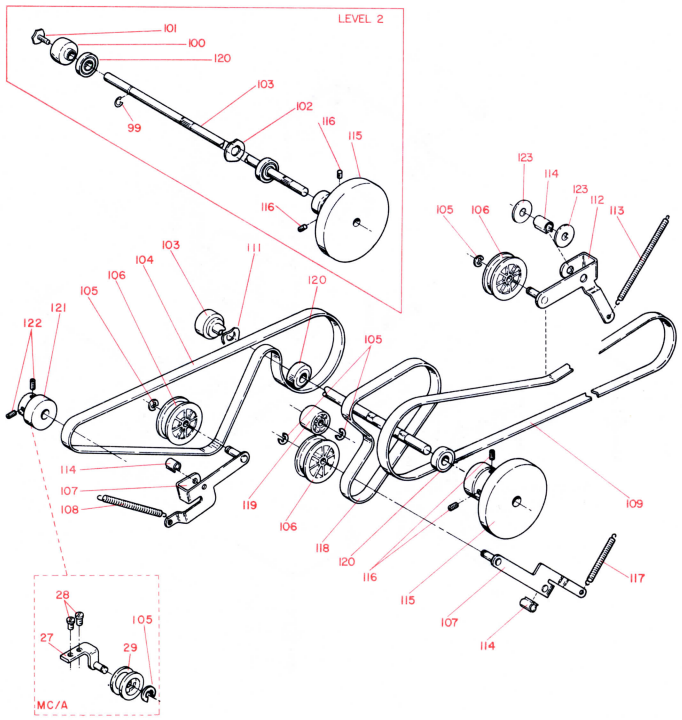
I. COIL LINE CORD AND I/O CABLE TOGETHER AND SECURE WITH TAPE. TAPE THE CABLE TO THE PRINTER AND COVER PRINTER WITH THE POLYBAG.

J. SECURE CARD DECK WITH SCREWS AND SPACERS AT FRONT, AND SCREW, SPACER, AND NUT AT REAR [6]. These items are stored in the flame retardant bag in the console or in the console holes provided under the card deck. Replace covers. Make sure they are latched and tape closed. Cover the console with the polybag.

K. Complete the "Returned Equipment Labels" and affix to the printer and console polybags.

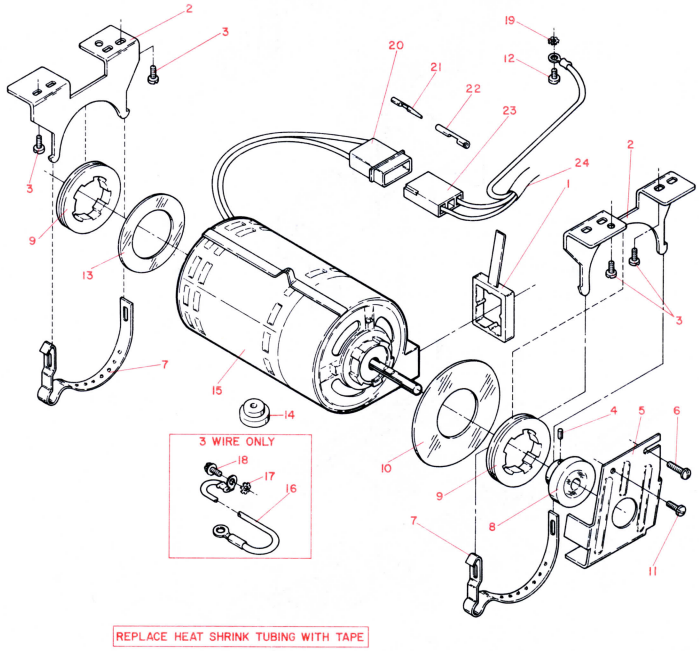
MOTOR
MC II – MC/A – MCC

MECH. CODE 82



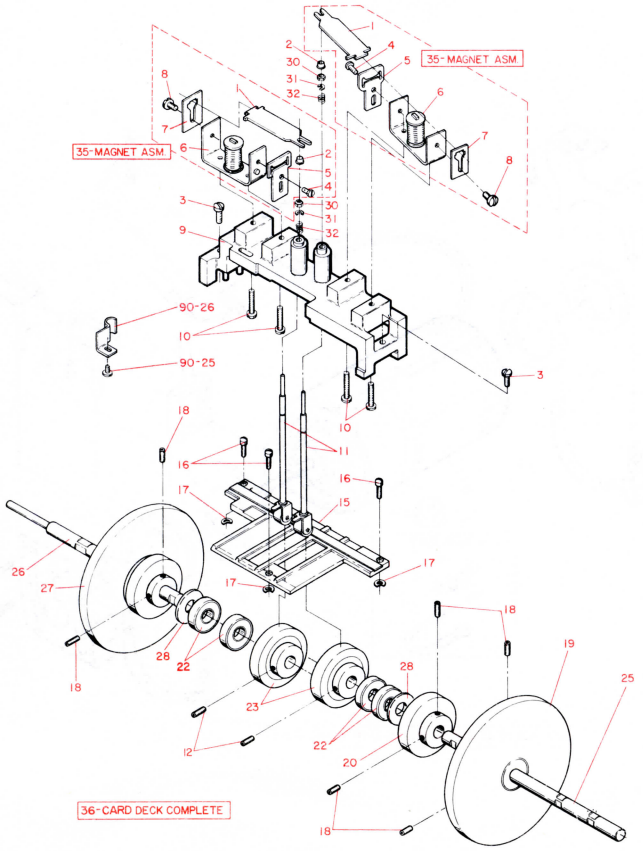
DRIVE
MC II – MC/A – MCC

MECH. CODE 82



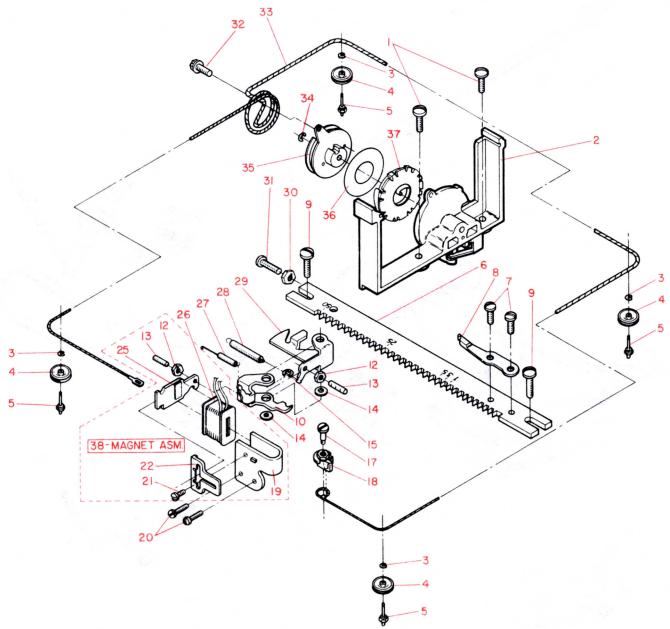
MECH. CODE **83**

CARD DRIVE
MC II – MC/A – MCC



MECH. CODE **84**

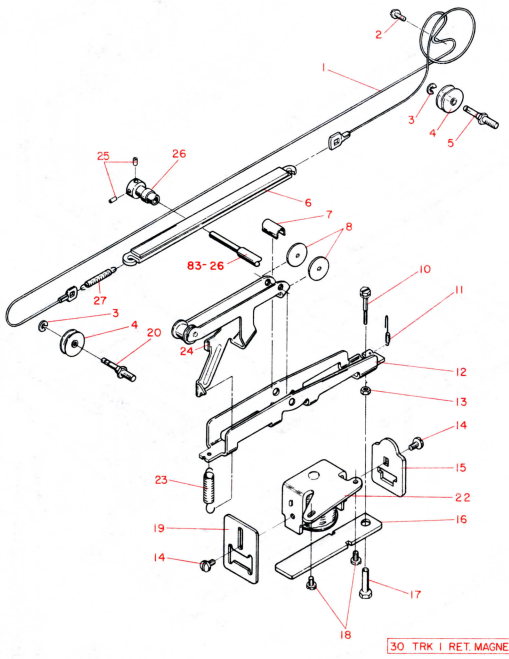
TRACK STEP
MC II – MC/A – MCC



TRACK 1 RETURN

MC II – MC/A – MCC

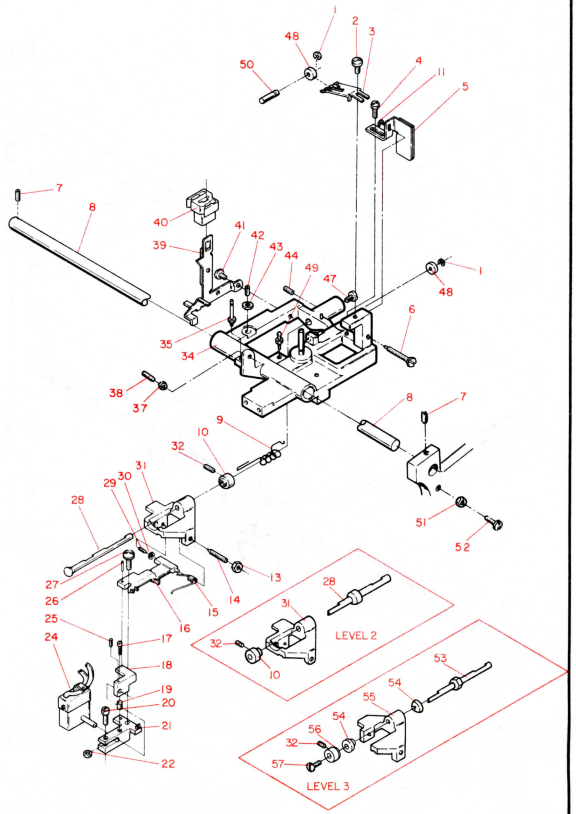
MECH. CODE 85



HEAD & CARRIER

MC II – MC/A – MCC

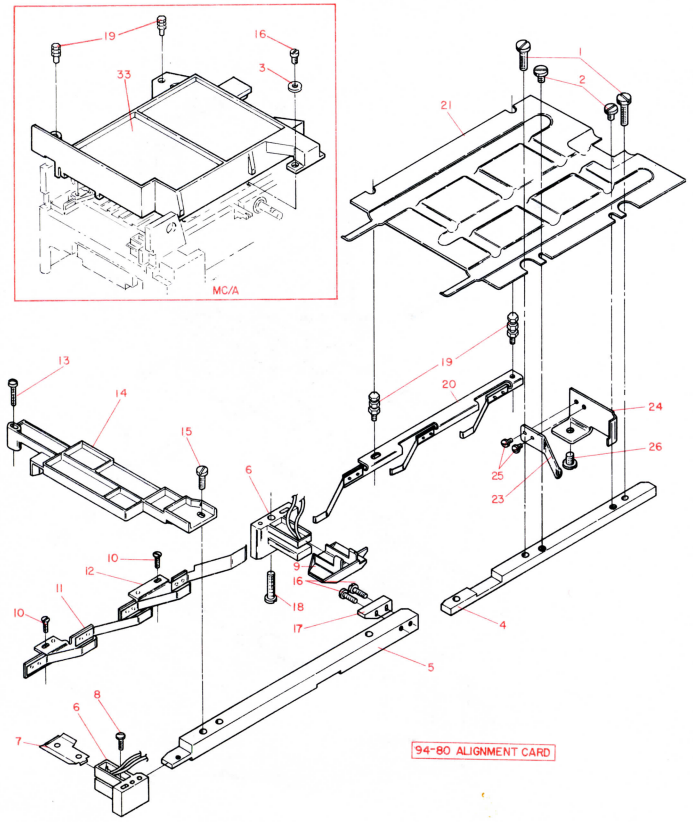
MECH. CODE 86



MECH. CODE **87**

CARD PATH

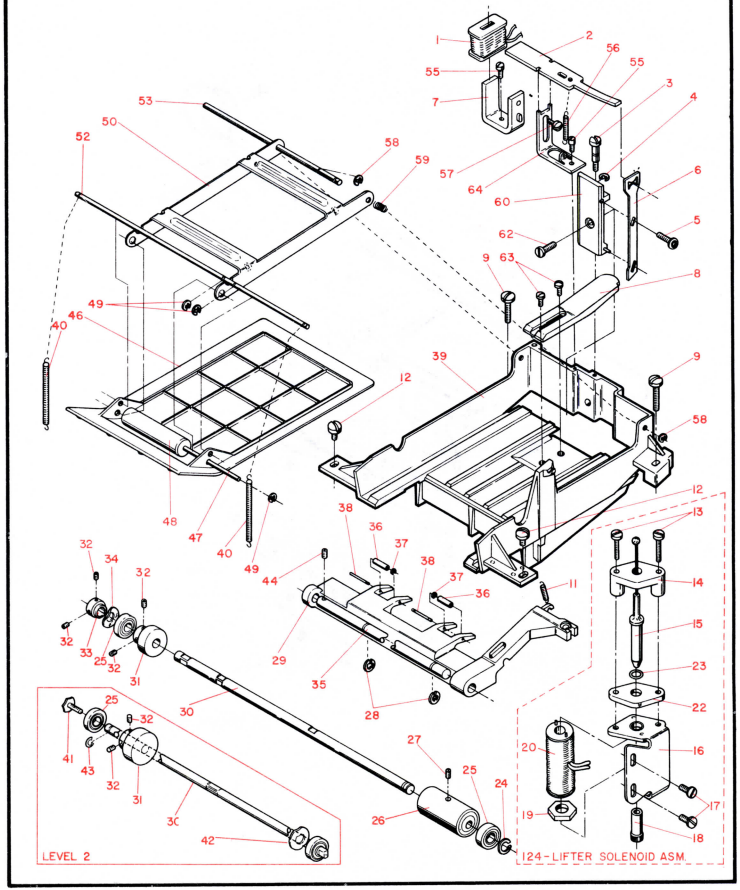
MC II – MC/A – MCC



MECH. CODE **88**

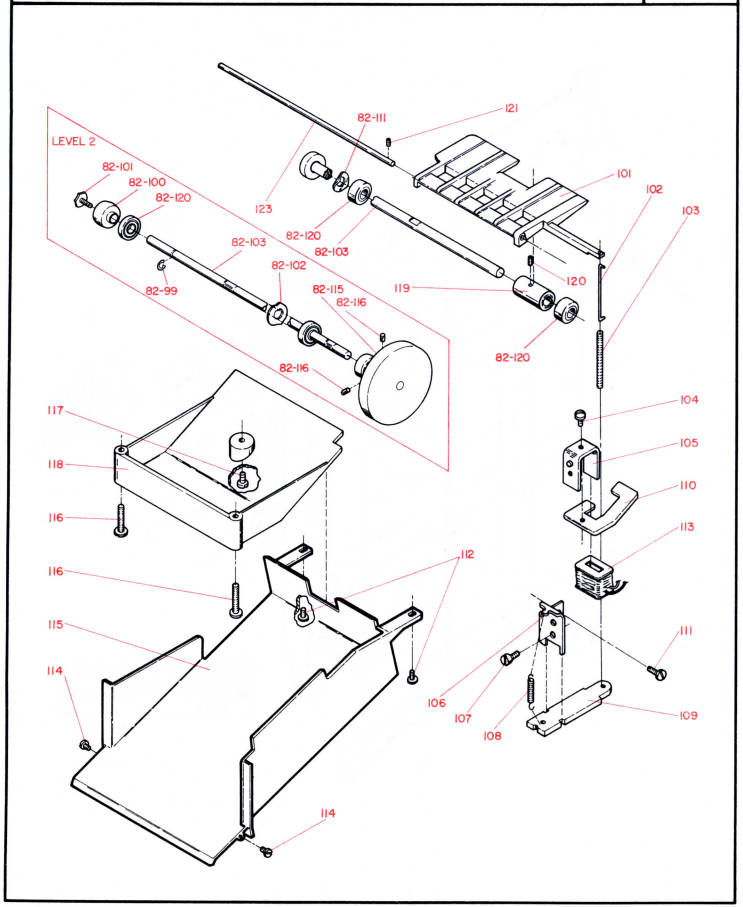
PACK FEED

MC II – MCC



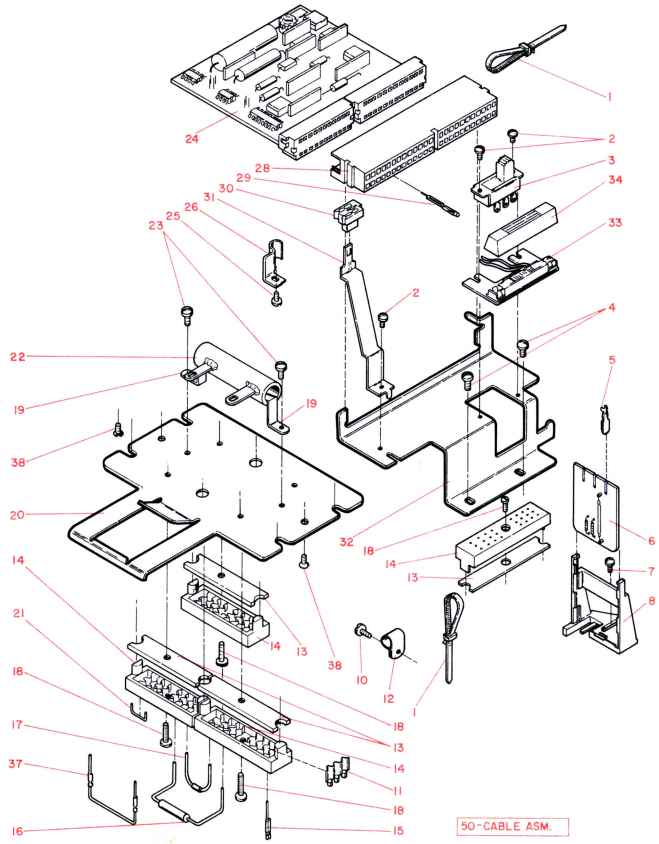
CARD STACKER
MC II – MC/A – MCC

MECH. CODE 88



ELECTRICAL
MC II – MC/A – MCC

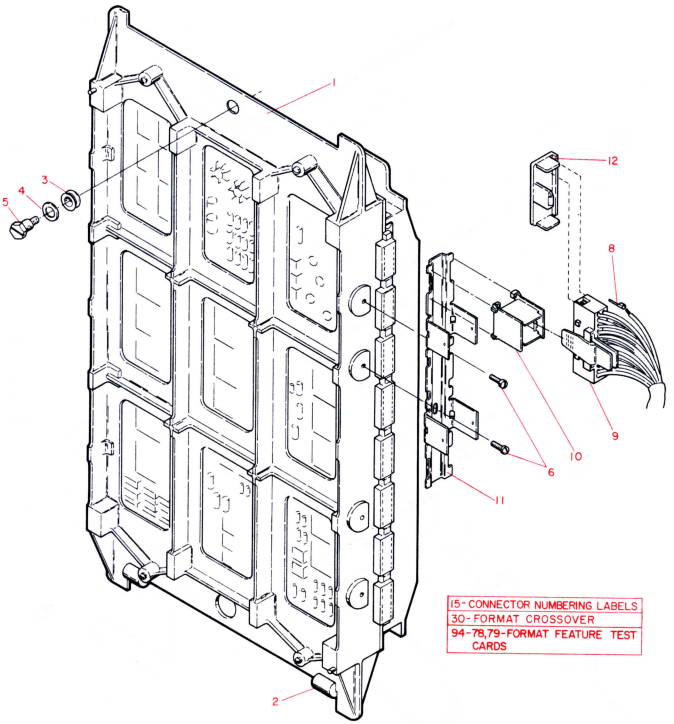
MECH. CODE 90



MECH. CODE

MECH. CODE
91

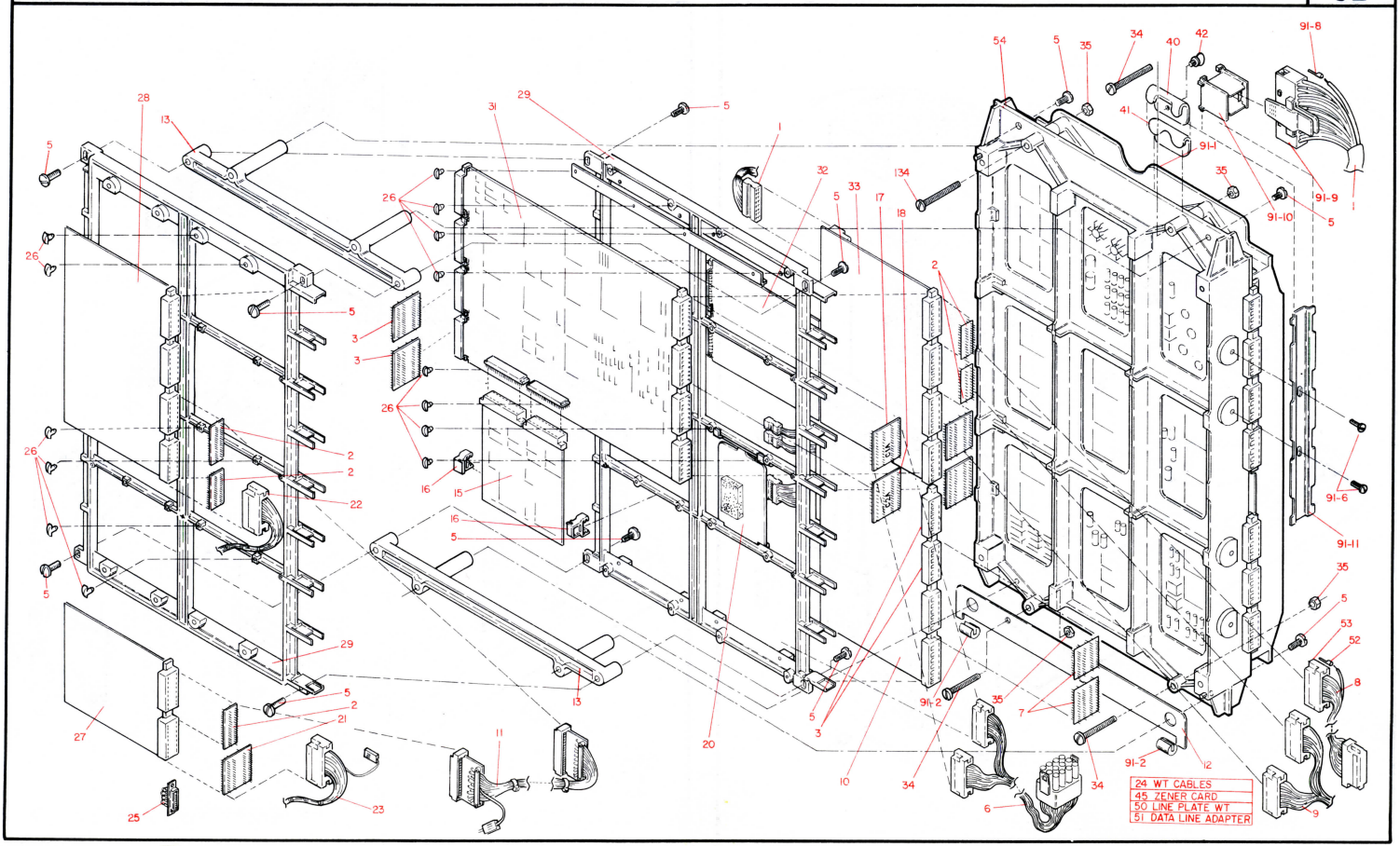
PLANAR PACKAGE
MC II—MC/A—MCC



COMMUNICATIONS FEATURE

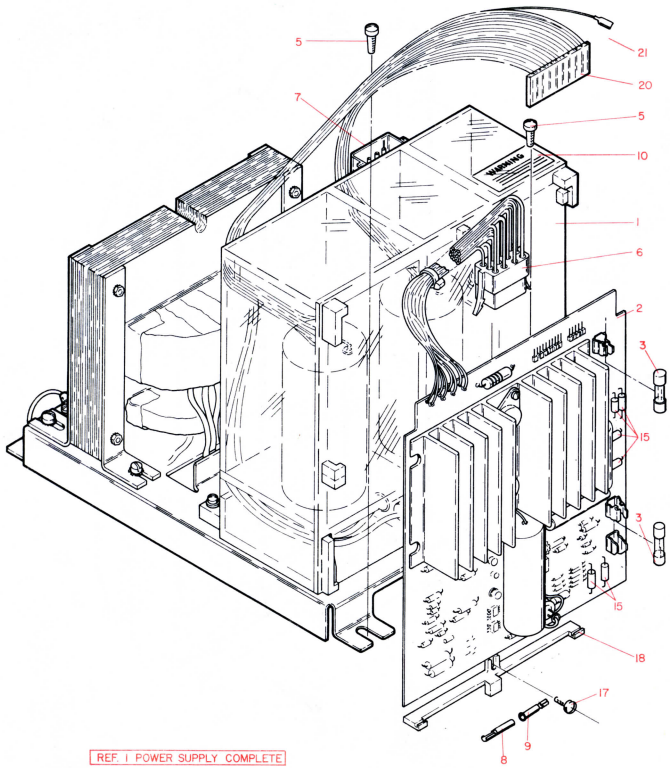
MC II-C

MECH. CODE 92



MECH. CODE **93**

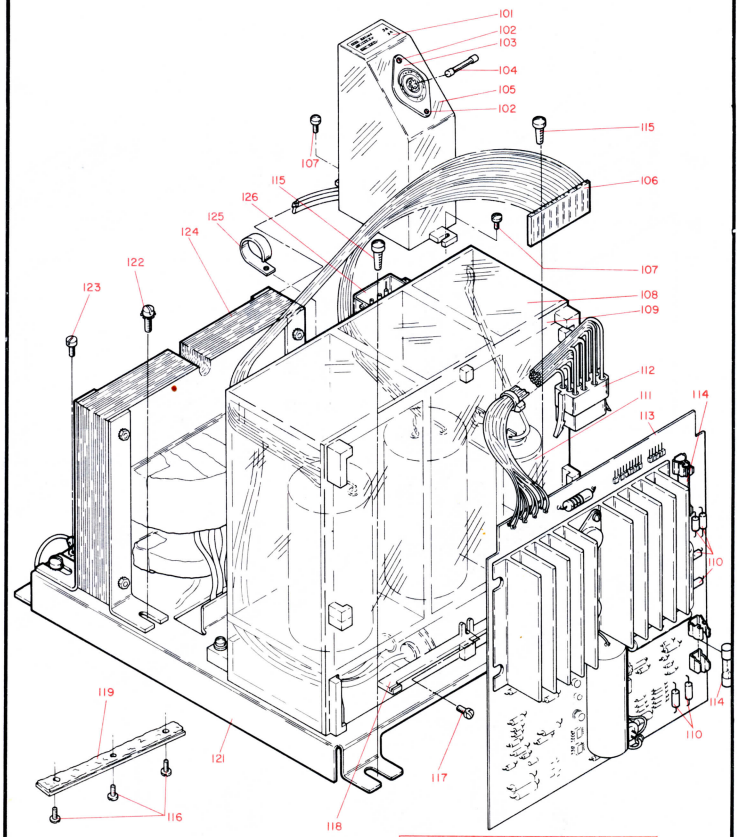
POWER SUPPLY
MC II – MC/A



REF. 1 POWER SUPPLY COMPLETE

MECH. CODE **93**

POWER SUPPLY
MC II – MC/A (WT)

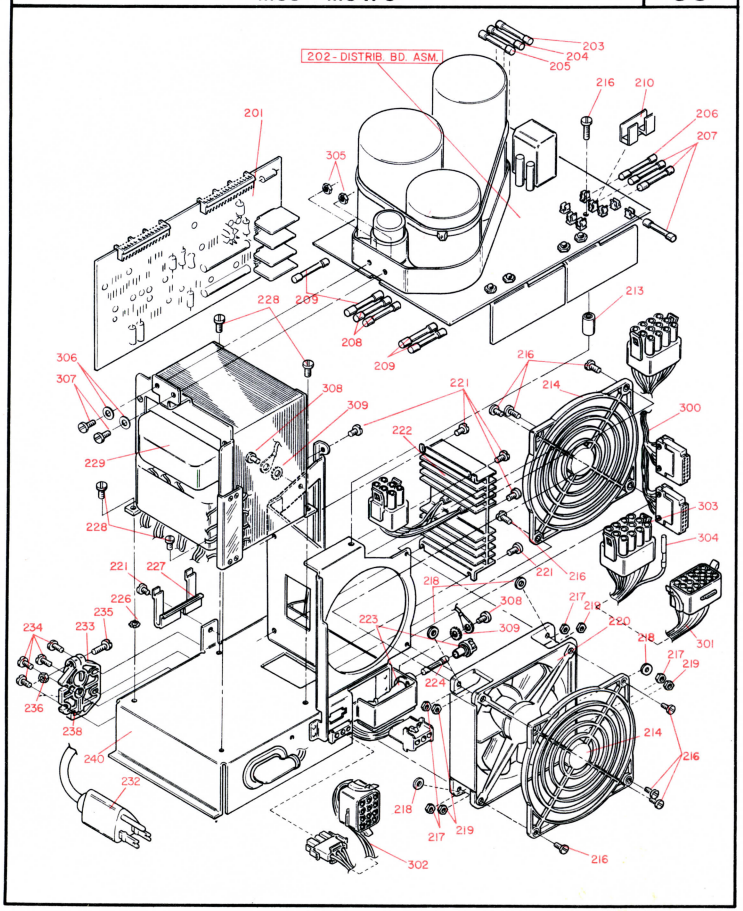


150-POWER SUPPLY ASSEMBLY COMPLETE W.T.

POWER SUPPLY

MCC – MC II-C

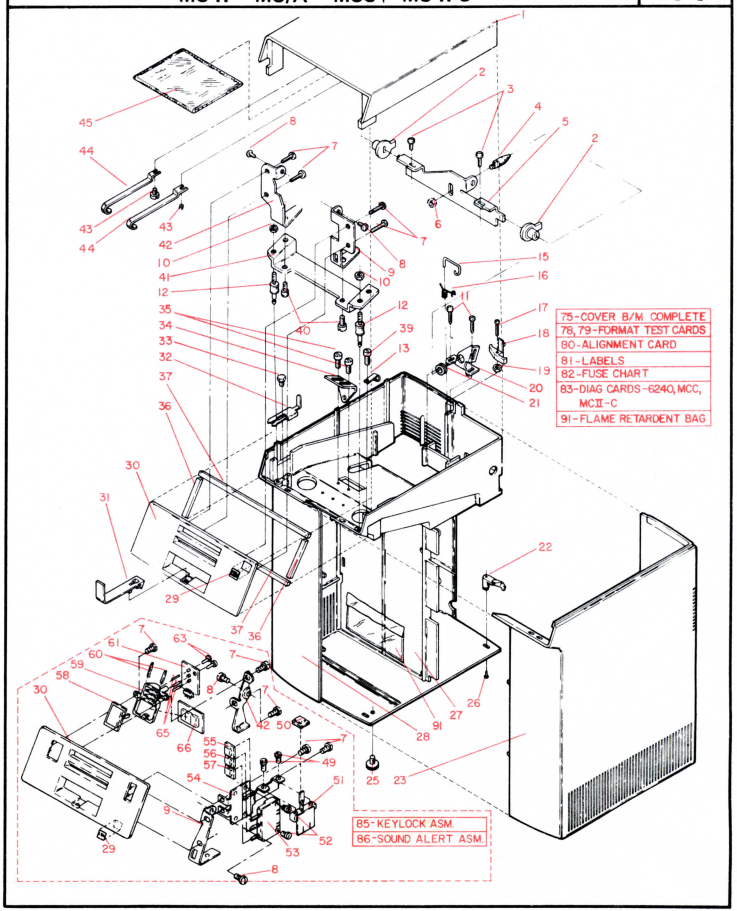
MECH. CODE 93



COVERS & MOUNTS

MC II – MC/A – MCC – MC II-C

MECH. CODE 94



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US	MACHINE IDENTIFICATION CODES	WT	WT 96 CHARACTER
MC	6610	MC72	
MC (CF)	6610	CMC	
E/MC	6614	E/MC	
MC II	6616	MC82	96 Char. MC82
MC/A	6620	MC80	MC90
Mem/T	5651	Mem/T	96 Char. Mem/T
ESC	6375	EC	

CAUSE OF FAILURE	CODE	CAUSE OF FAILURE	CODE
Bent/Warped	01	Stripped	15
Binding/Sticking	02	Wiring Defects	16
Broken/Cracked	03	Weak	17
Burned/Pitted/Burred	04	Worn	18
Card/Tape Jam	05	No Trouble Found	19
Dirty/Corroded	06	Other	20
Loose/Solder Conn.	07	Standby	21
Lubrication	08	Operator Preference*	22
Noise (Mech.)	09	Sound Distortion	23
Off/Off Registration	10	Beat The Operation	24
Open	11	Flicking	25
Out of Adjustment	12	Operator Error	26
Out of Alignment	13	Noise Electrical	27
Shorted/Grounded	14	Low Contrast	28

*Operator Preference – Adjustment due to operator opinion which is not a malfunction of the machine.



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